June 30, 1947

# STEEL

The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

EDITORIAL INDEX, PAGE 29

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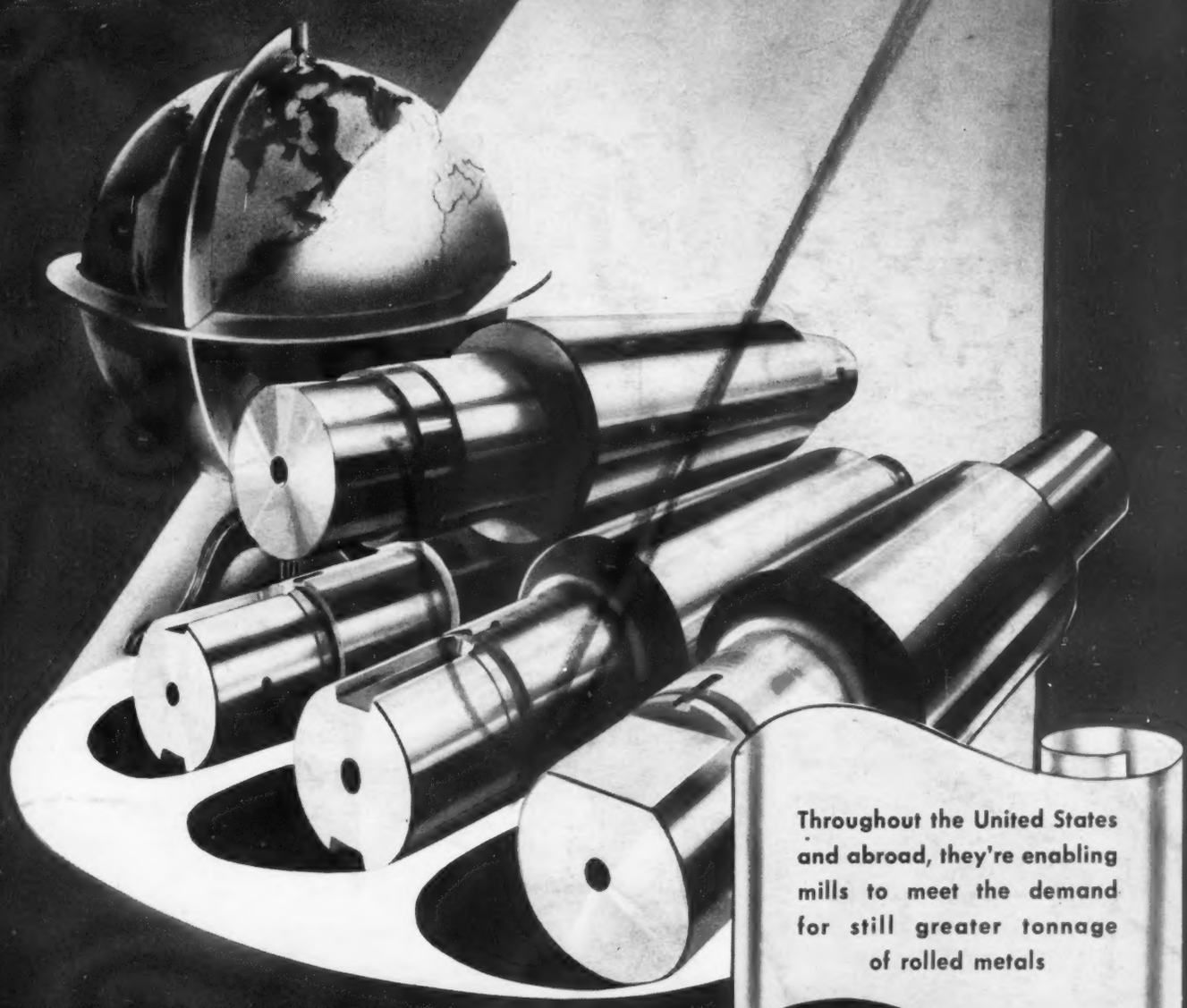
DETROIT

LEWIS ROLLS



Throughout the United States and abroad, they're enabling mills to meet the demand for still greater tonnage of rolled metals

LEWIS FOUNDRY & MACHINE

DIVISION OF BLAW-KNOX COMPANY, PITTSBURGH, PA.

ALSO MANUFACTURERS OF
ROLLING MILL MACHINERY
FOR THE IRON, STEEL AND
NON-FERROUS
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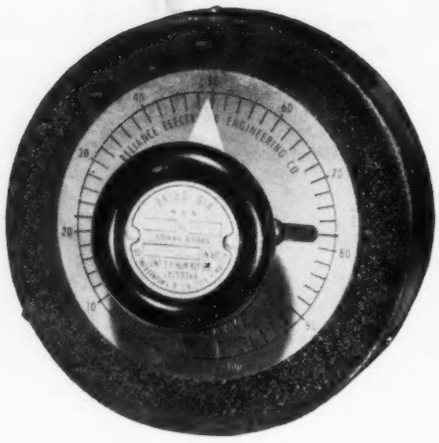
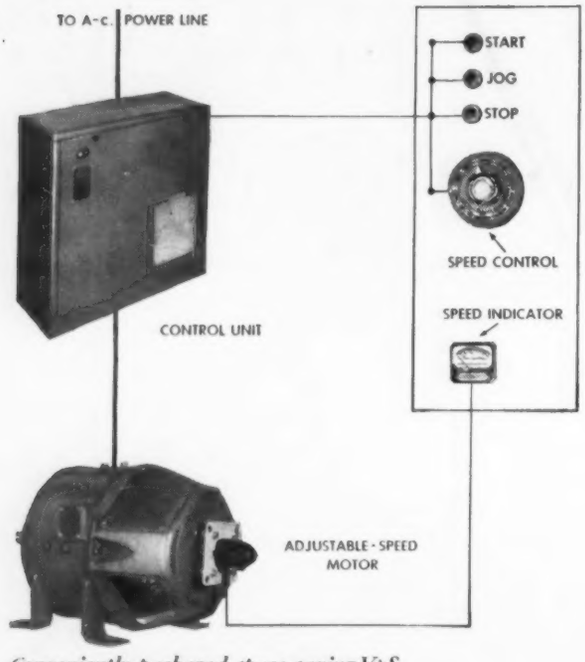
RELIANCE V★S DRIVE



# Greater PRODUCTION with ADJUSTABLE-SPEEDS

## ...from A-c. Circuits




*Conveniently-packaged, space-saving V★S Drives are available from 1 to 200 hp.*

Actually, Reliance V★S Drive is an *electric transmission.* At the touch of a button your machine can be started or stopped. Turn the knob of a rheostat and it can be accelerated or decelerated smoothly—over an infinite range of stepless speed changes. And with this *All-electric, Adjustable-speed Drive operating from A-c. Circuits,* control can be either automatic or manual . . . at the machine or from remote stations. The net result of V★S control is greater efficiency, faster production, lower costs—as already proved in every industry. That's why it will pay you to write today for Bulletin 311.

**RELIANCE ELECTRIC & ENGINEERING CO.**
**1081 Ivanhoe Road • Cleveland 10, Ohio**

Appleton, Wis. • Birmingham • Boston • Buffalo • Chicago • Cincinnati • Dallas
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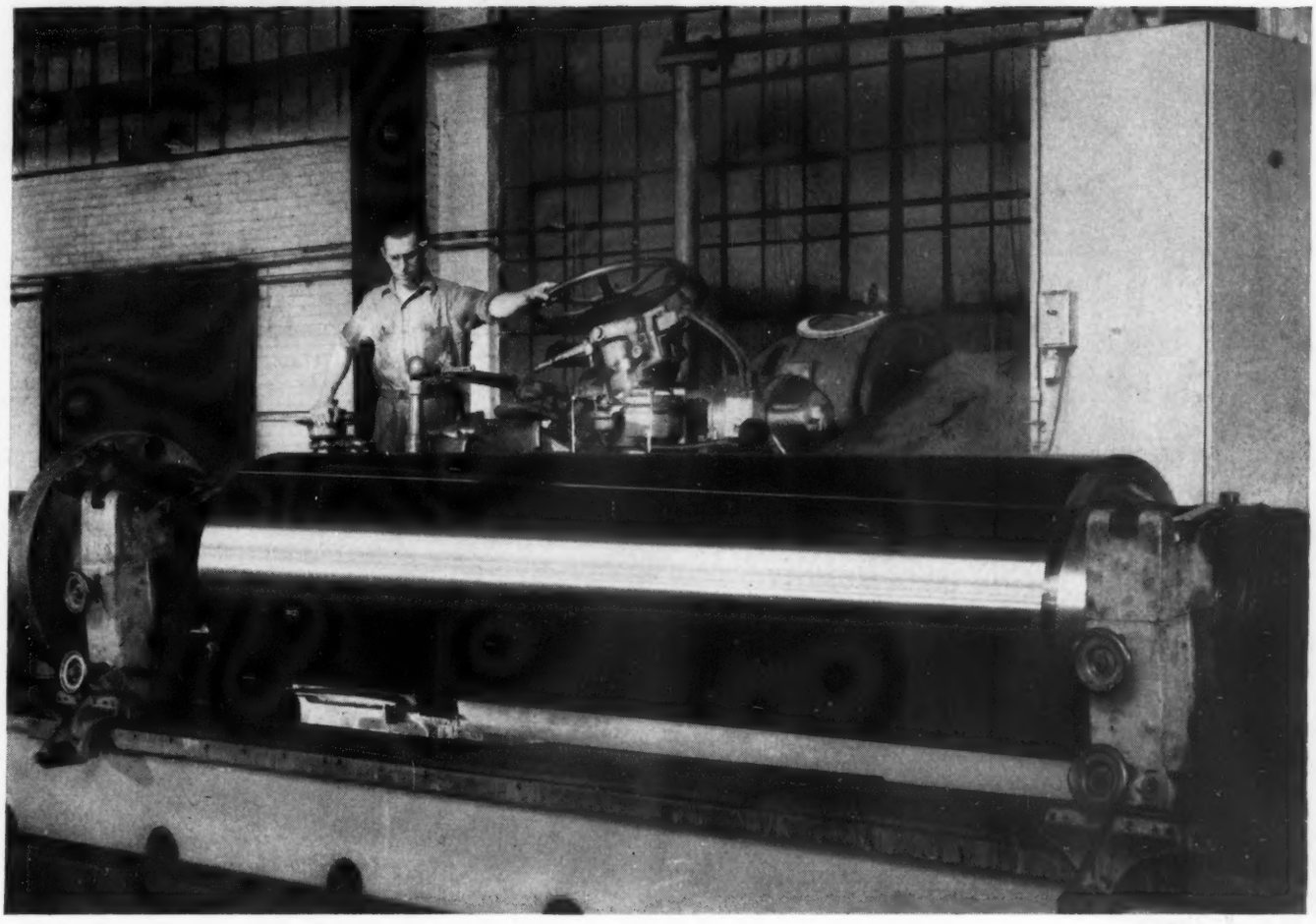
**RELIANCE A-C D-C MOTORS**

*"Motor-Drive is More Than Power"*

# ALL SIZES OF
# Forged Hardened Steel Rolls
## *Available at Bethlehem*



We make them to your order—forged hardened steel rolls for cold-rolling sheets, tinplate, and ferrous or non-ferrous strip.

These carefully-made products have been an important Bethlehem specialty for years. From start to finish, they represent precision manufacture, rigid adherence to specifications.

Bethlehem has ample facilities to meet your requirements promptly and expertly. Whenever you need rolls, take advantage of our long experience in this exacting business.

Bethlehem Steel Company, Bethlehem, Pa.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

★ BETHLEHEM STEEL ★

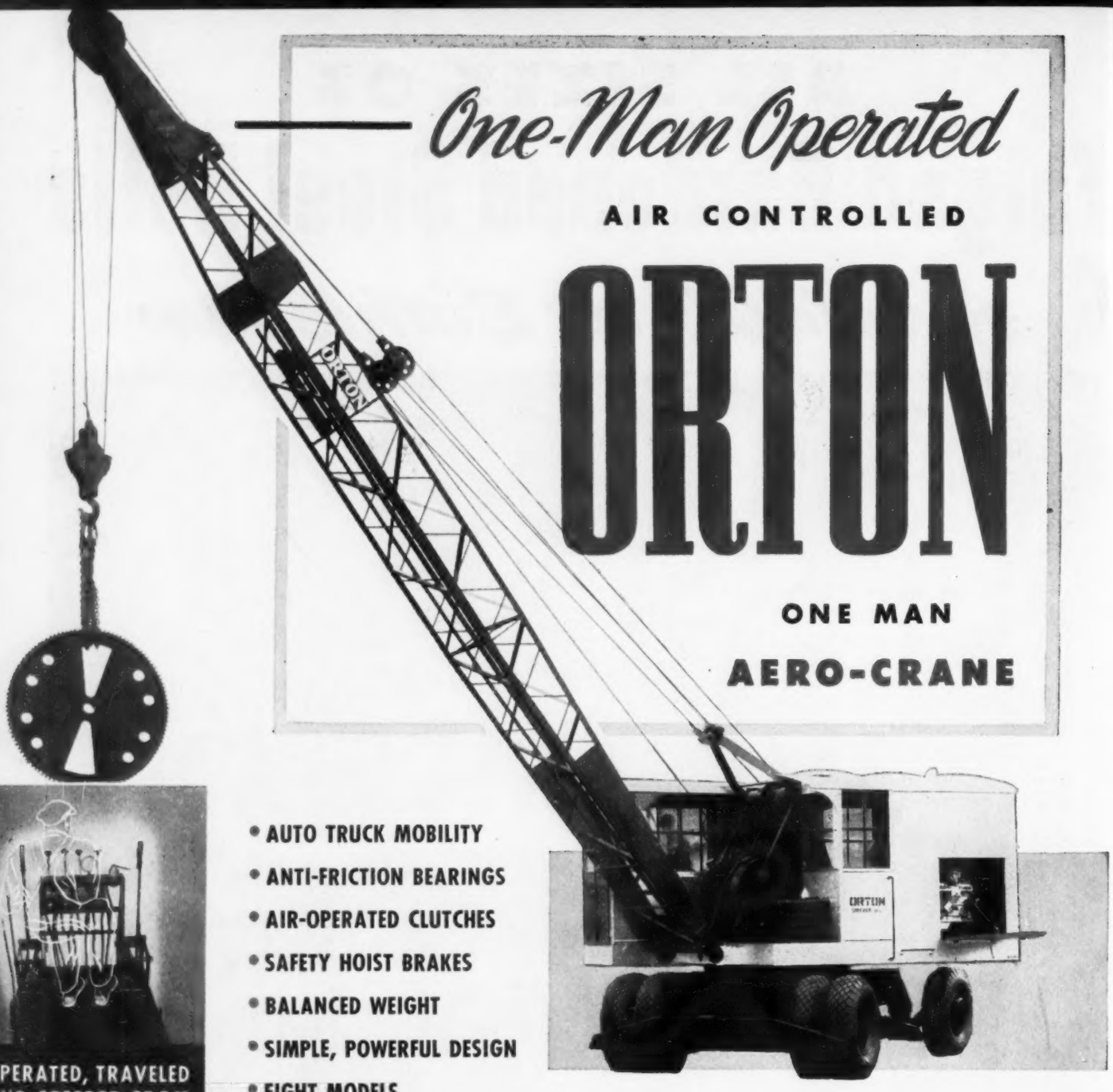
*One-Man Operated*

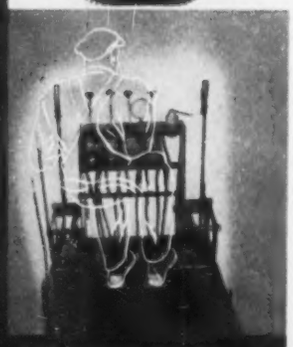
AIR CONTROLLED

# ORTON

ONE MAN

AERO-CRANE





OPERATED, TRAVELED AND STEERED FROM THE CRANEMAN'S SEAT

- AUTO TRUCK MOBILITY
- ANTI-FRICTION BEARINGS
- AIR-OPERATED CLUTCHES
- SAFETY HOIST BRAKES
- BALANCED WEIGHT
- SIMPLE, POWERFUL DESIGN
- EIGHT MODELS

**WITHOUT fatigue, and all day long, *one man*, with an Aero-Crane, does the work of 4 or 5 men—gets your material onto the stockpile and out again at minimum cost. With the Aero-Crane one man handles 200 to 1000 lb. loads that eat up the time of a yard crew.**

**Designed for rapid yard work, the Aero-Crane goes anywhere a truck can go. You can travel it light or loaded with boom in any position. Tough-built, with anti-friction bearings throughout, electric welded construction, non-burn clutches, Air-controls, Aero-Crane keeps going free of breakdowns—pays for itself in saved man-hours.**

**Built in a range of eight models. Capacities of 3,500 to 60,000 lbs. at 12 foot radius. Diesel or gasoline powered.**

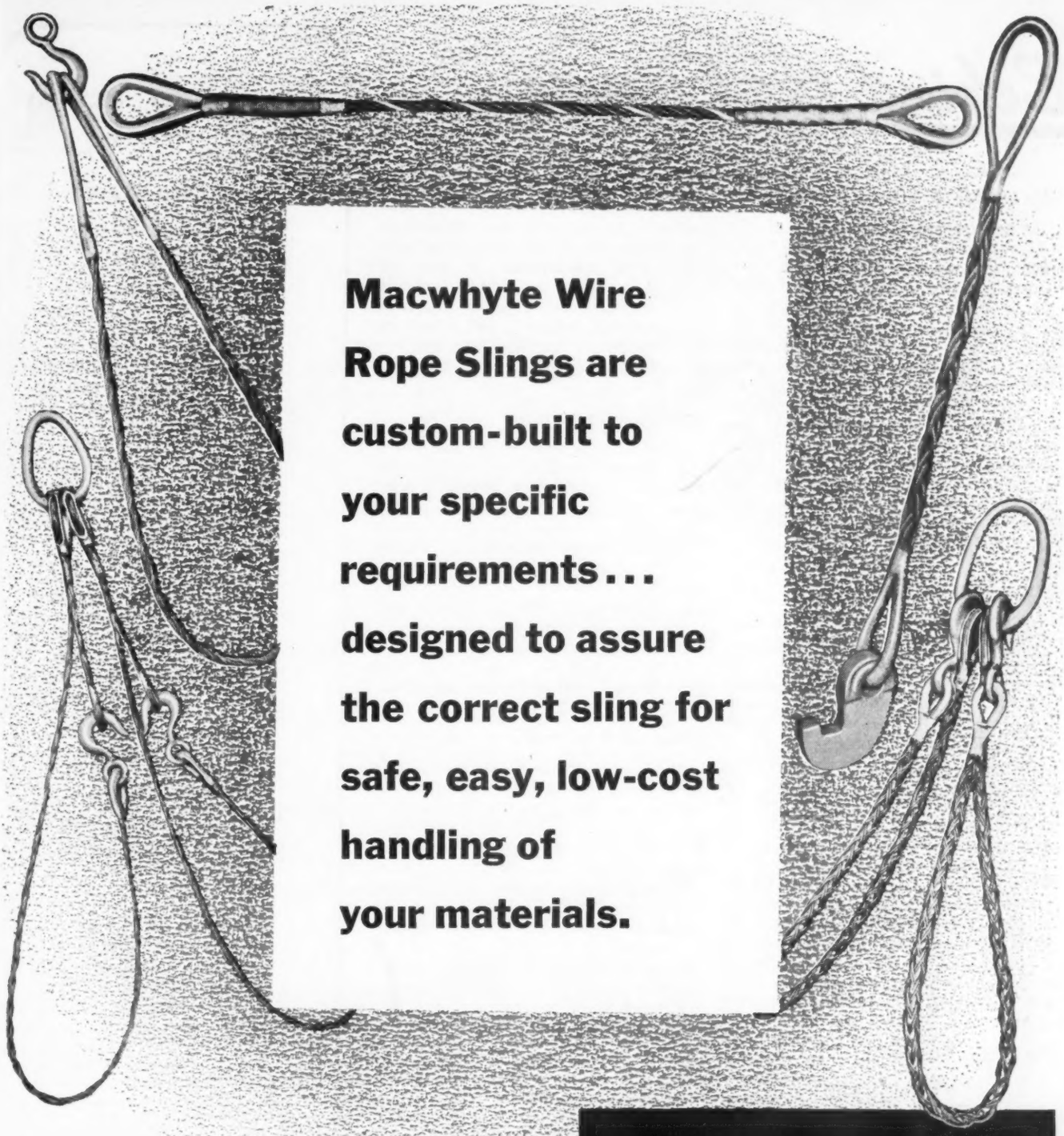
*CATALOG 73 GIVES THE DETAILS. SEND FOR IT.*

SENSITIZED

POWER

## ORTON CRANE & SHOVEL CO.

608 S. DEARBORN ST., CHICAGO 5, ILL.



**Macwhyte Wire Rope Slings are custom-built to your specific requirements... designed to assure the correct sling for safe, easy, low-cost handling of your materials.**

*Macwhyte engineering service is available* to help design the correct sling for your job. Our sling engineers will give you the benefit of their broad experience in designing hundreds of slings for handling loads similar to yours. Ask your Macwhyte distributor, or write Macwhyte Company.

Macwhyte also makes: MACWHYTE PREformed and Non-PREformed Internally Lubricated Wire Ropes... MONARCH WHYTE STRAND Wire Rope... Special Traction Elevator Rope... Stainless Steel Wire Rope ... Monel Metal Wire Rope... Galvanized Wire Rope... Hi-Fatigue Aircraft Cables, Assemblies and Tie-Rods. *Catalog, literature on request.*

**MACWHYTE WIRE ROPE SLINGS**

**Manufactured by Macwhyte Company**
**2912 Fourteenth Avenue, Kenosha, Wisconsin**

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NO. 919-S

**Make**

# MACWHYTE

**your headquarters for**

# WIRE ROPE SLINGS

# Behind the Scenes...

## We're All A Pressure Group

Letter from H. G. Durnell of the Union Machine Co., Bartlesville, Okla., prompts us to repeat here what we've been doing in re letters to Congress. Mr. Durnell tells us he wrote to his congressman and referred to one of Mr. Shaner's editorials of recent date. Many of you readers have been doing the same, and we're backing up your opinions by sending copies of the weekly editorial to all members of Congress. If any of you are interested in making this message stronger, we will be happy to supply additional copies for individual mailings as long as our supplies last. Just drop us a line and we'll ship out as many as you need.

## More Nigerian News

Those Nigerians certainly die hard. Comes in the mail an epistle from Frances Box of Solar Aircraft Co., an outfit which recently ran advertising copy featuring a picture of a cake, illustrating a well-chosen metaphor. Back from Lagos popped the inevitable letter, pointing out that Solar is probably the best manufacturer of cake and if they would just send a sample cake, the writer would be sure to recommend it to all his friends in Lagos, etc., etc.! Some day out of sheer curiosity we are going to write a letter to the Mayor of Lagos and inform him that he has been recommended to us as the best something-or-other on the Gold Coast, and if he would just send us a few pounds of gold as a sample, we will be happy to recommend him to all our friends (4) in the United States.

## He Told 'Em Off

Well, we have found a gentleman after our own heart. He is F. L. LaQue, whose heart lies in the nickel business and whose courage in the face of an editor is what we admire. Given the task of addressing a group of editors and welcoming them to a recent inspection tour, Mr. L stood up on his hind legs and told them off in fine style, winding up his talk with these words: "In presenting your copy for review prior to publication, please make it brief with no more than two lines to the page so that we can cross out the drivel you will write and have room to write in something that we won't be ashamed to see in print. We shall need more than the customary eight hours before the publication deadline to accomplish this. So far as the description of the project is concerned, our principal activity for the immediate future will be to get you guys the hell away from here so that we can go on with what we are doing." Our spies failed to report just what the editors' reaction to this welcome was. That was probably because the spies themselves are editors in real life and wouldn't admit to their real feelings. If you're interested in what the editors actually wrote on those 2-line pages, this here magazine will publish a full report on the Kure Beach corrosion tests just two weeks from today (advt).

## Mailbox Roundup

Answering the mail, by fits and starts. . . . Thanks to F. S. Collins, Franklin Products Co., for a nice letter and them sweet compliments . . . and to G. Harris Danzberger of Lukens Steel for his poem about our twelfth birthday . . . and to Eliot S. Boardman of the Federal Reserve Bank of Boston for straightening us out on that letter referring to their previous letter which we didn't receive . . . and to all the puzzle fans who have sent in solutions and new puzzles, but who haven't had acknowledgment in print.

## Note of Explanation

Some of our puzzle fans probably think we are nuts or else don't read our mail or something, so we will devote a small amount of space here to a brief explanation. Seems that on a couple of occasions we have noted no answers to certain of our puzzles, when all the time answers have been coming in. The reason is that we're tucked way up here in the front of the book, and in one of the parts of STEEL which gets printed earliest. In order to reach you complete and fresh on Monday morning, printing begins during the second week previous to date of issue. That means the piece we're writing now won't see you readers for almost two weeks. This is being written June 17, for the June 30 issue—so if you have sent in correct answers to one or more of the puzzles we've been running here, only to have us claim that nobody had yet sent in the correct answer, don't be disturbed. We probably have read your contribution and marveled that anybody could figure out the right answers so rapidly.

## Puzzle Answer

Since nobody has sent in the correct (?) answer to the one about the conical whiskey cup, we'll have to break down and tell what it is. According to our answer book, the circumference of the lip of the cone was 4.6119 inches. All arguments gracefully accepted.

Shrdlu

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STEEL
Vol. 120—No. 26 June 30, 1947

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*Editorial Staff on Contents Page*

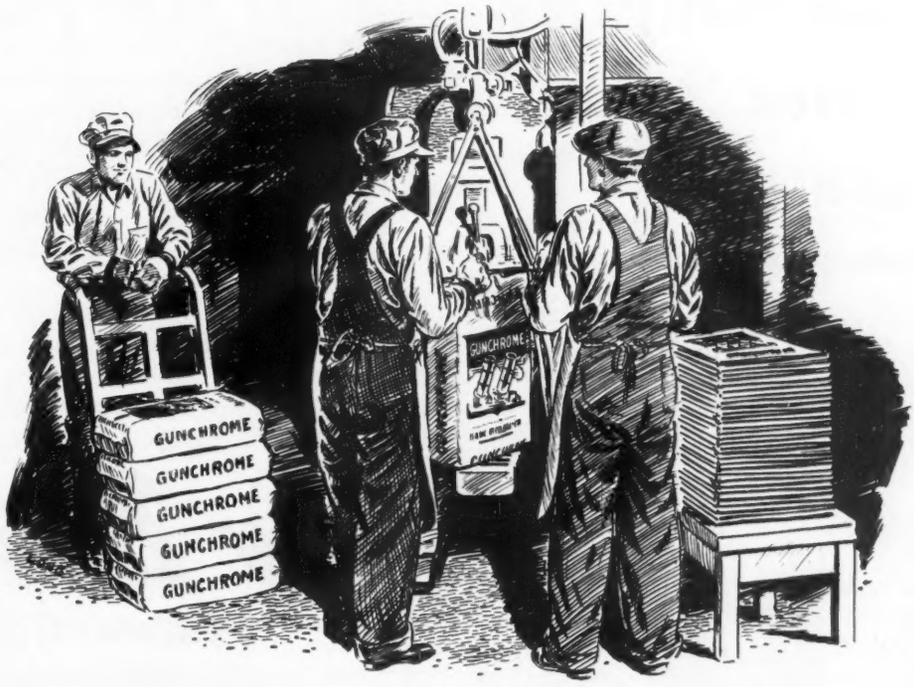
# "GREATEST THING SINCE THE SLAG POT!"

THAT'S what one open hearth man said the other day when he saw a Gunchrome demonstration.

Gunchrome is our new chrome-base, chemically bonded maintenance refractory, designed for emplacement by means of an air stream. It is finding numerous uses in the open hearth. One of the most popular is for repairing the backwall along the skewback, and for maintaining other spots in the furnace which are difficult to reach with a shovel.

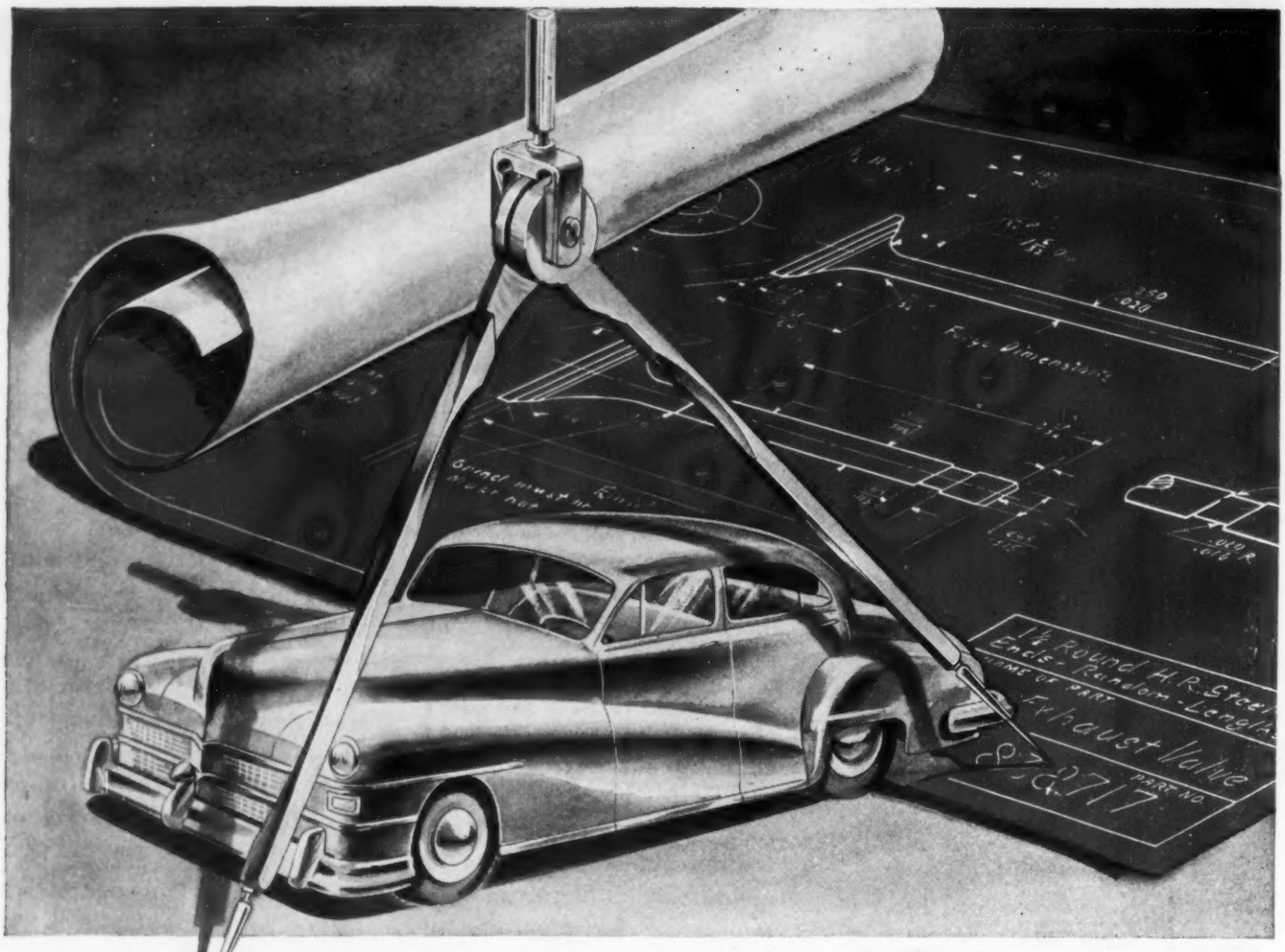
The new B.R.I. Gun was developed especially to apply Gunchrome and our original basic gun refractory, Gunmix, to vertical and semi-vertical wall structures. The gun emplaces these refractories, properly wetted at the point of discharge, at the rate of more than 100 pounds per minute.

The Basic Engineer who serves your company will be glad to arrange a demonstration of Gunchrome, Gunmix and the B.R.I. Gun at your plant.




*Basic Refractories Incorporated* **845 HANNA BUILDING, CLEVELAND 15, OHIO**

***Exclusive Agents in Canada:*** *REFRACTORIES ENGINEERING AND SUPPLIES, LTD., Hamilton and Montreal*




# ALL THE GOOD NEWS COMES FROM PRODUCTION EFFICIENCY

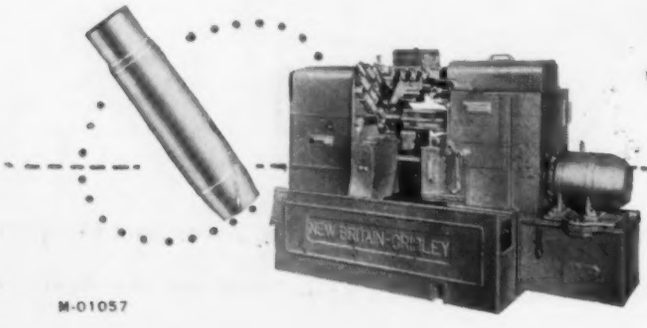
PAYING for higher wages and maintaining profits by raising prices is a sure formula for stagnation.

Lowering prices at the expense of wages or earnings on investors' savings produces the identical result.

Lower *costs,* resulting from *greater manufacturing efficiency,* is the answer. Here is something management and labor agree on wholeheartedly. But you don't *get* it by agreeing about it.

Engineers, by designing new automatic machines, new tools, and new set-up methods, have offered the key to solving the problem. It's up to management to make these better machines and methods available. It's up to the man at the machine to use that machine for all it's worth.

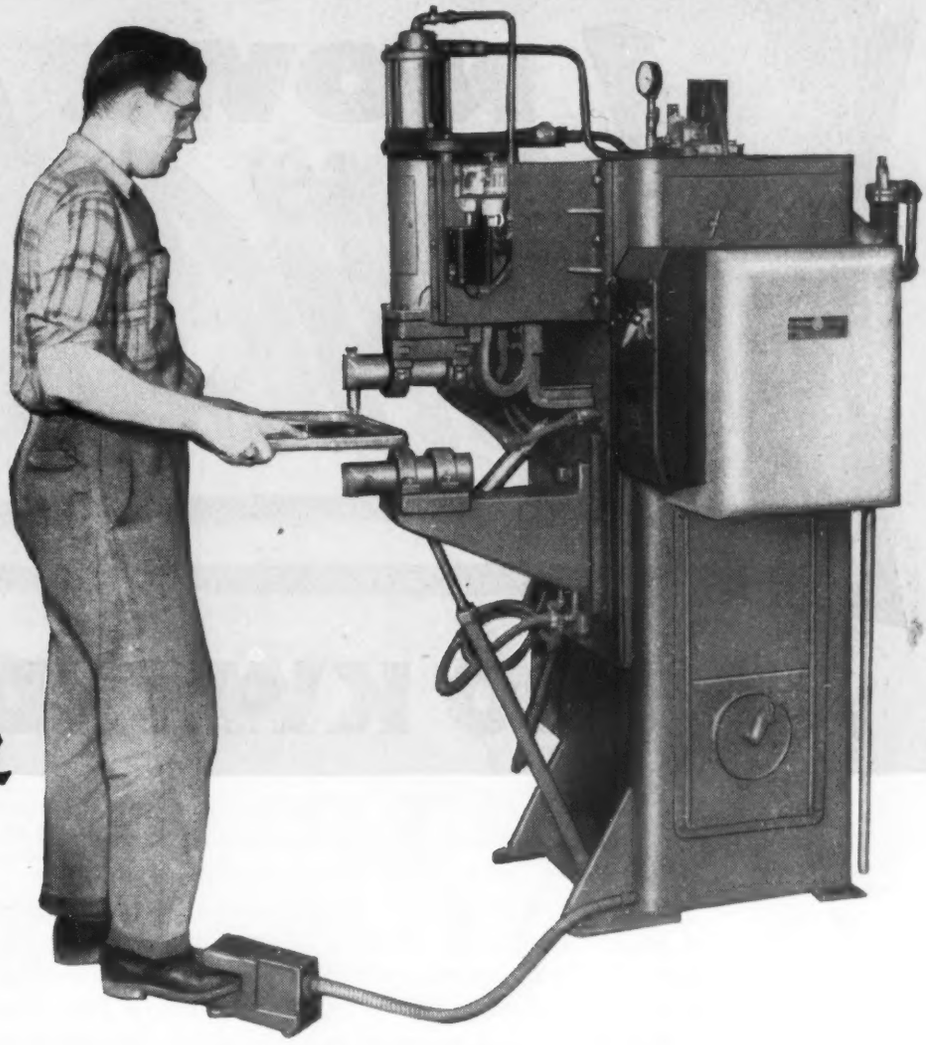
EXAMPLE: Formerly a leading automotive manufacturer found it necessary to rough grind the O.D. of this valve stem guide, machine the I.D. and then finish grind the O.D. Today the outside diameter is finish ground before being magazine fed into a Model 60 New Britain screw machine, which turns out over 406 pieces per hour with concentricity between inside and outside diameters well within the required .002 total indicator reading. Here is a sound saving, which, repeated in thousands of thousands of parts makes an important contribution to lowered costs.




M-01057

**New Britain**
*Automatics*

**THE NEW BRITAIN MACHINE COMPANY**
**NEW BRITAIN-GRIDLEY MACHINE DIVISION**
**NEW BRITAIN, CONNECTICUT**



This G-E sequence weld timer automatically provides accurate timing of the welding cycle at Bailey Meter Company, Cleveland.

# WELDS *4 times faster*

# with G-E ELECTRONIC WELDING CONTROLS

Bailey Meter Company has increased its production rate of certain meter and automatic control parts 400 per cent with a new projection welding machine equipped with a G-E sequence weld timer and ignitron contactor.

With spot welding it took 18½ hours per 100 pieces; now, it takes 4½. G-E welding controls are responsible for a good share of this increase because they provide automatic and accurate timing of the welding cycle.

This timing eliminates the delay and operator error of the manual control on the foot-operated machine formerly used. And, it assures more consistent welding.

**NOW, G-E CONTROLS ARE AVAILABLE IN ONE CABINET**

General Electric now offers two new, improved lines of welding control—synchronous and nonsynchronous. Each has all its components co-ordinated in one, attractive cabinet. Check these outstanding features:

1. **Control is factory-assembled, ready-to-install.**
2. **Easy servicing through large side door of cabinet.**
3. **Control station always faces operator.**

Investigate these and other features in Bulletins GEA-4699 and GEA-4726.

**HAVE YOU SEEN** "This Is Resistance Welding," G.E.'s full-color movie? It explains what resistance welding is, and where and how it has improved production.

Your nearest G-E office, local utility, or resistance welding machinery manufacturer representative will be glad to arrange a free showing for you.

**GENERAL ELECTRIC** 645-42

General Electric Company, Sec. A645-42
Schenectady 5, New York

*Please send me the following resistance welding control bulletins:*

- ☐ GEA-4699 Synchronous Precision Control for Spot and Projection Welding
- ☐ GEA-4726 Nonsynchronous Control for Spot and Projection Welding
- ☐ GEA-4571 The Importance of Control
- ☐ GEA-3318B Sequence and Sequence Weld Timers
- ☐ GEA-3158D Ignitron Contactors

Name .....

Company .....

Address .....

# NOW.. Immediate

# ..ON 20 KW INDUCTION

MILWAUKEE, WIS. Allis-Chalmers announces expansion of its facilities to *mass-produce* 20 kw Induction Heaters! Now customers can get delivery within a matter of days after receipt of order.

Because of a special output circuit, these heaters will handle a wide variety of jobs without the additional original expense and set-up changes required with special output transformers. In addition, Allis-Chalmers Induction Heaters offer *many* outstanding features that will help cut your processing costs.

We invite you to send sample parts for processing. "A-C" engineers will perform the work specified, and you will be given estimates of per-piece production and original equipment costs. ALLIS-CHALMERS, MILWAUKEE 1, WIS.

## 101 Heating Problems Solved with Allis-Chalmers

**Hardening knife blades.** Average heating time 10 to 12 seconds. Hardening confined to blade only. Handle area remains soft.

**Braze shafts to steering knuckles.** Production rate 400 per hour. Objectionable scale completely eliminated.

**Temper gear spline surface** for broaching. Selectively applied heat confines tempering to desired area . . . leaving balance of gear hard.

**Harden valve stem tips** to prevent wear and mushrooming. Valve stem tip only is heated and balance of valve stem retains original properties.

**Progressive surface hardening** of piston pins. Set-up handles up to 1200 per hour depending on size and depth of penetration required.

**Soft soldering rotors** for small induction motors. Production rate increased . . . penetration is better, and considerable savings in solder are evident.

**Braze silver contacts** to copper bus-bars. Production increased 100% . . . rejects almost entirely eliminated.

**Hardening rock bits.** Bit surface induction hardened to 1/8" depth only. Original ductility of core maintained to prevent breakage. Heating time 11 seconds.

# ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products

1847 1947
A CENTURY OF SERVICE
to Industry
THAT MADE
America Great

# Delivery!

# HEATERS

## 3 Standard Sizes!

20 kw Output
Dimensions
36 in. x 36 in.
x 80 in. high.

50 kw Output
Dimensions
89 in. x 57 in.
x 82 in. high.

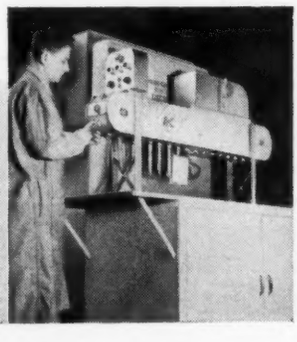
100 kw Output
Dimensions
146 in. x 75 in.
x 88 in. high.

## Induction Heaters!

**Soft soldering pressure gauge bellows.** Heat is applied rapidly to form an air tight seal and temper of bellows is unaffected.

**Hardening wearing surface** of clutch collars. Induction heat hardens to approximately 1/32nd inch depth and original ductility of balance of part is unaffected.

## Variable Speed Conveyer Handles Variety of Knife Blades!



Typical of Allis-Chalmers complete induction heating service is this new type conveyor, recently designed and manufactured for a large midwestern manufacturer of knives. Complete flexibility is obtained through the use of unique clamping plates which securely grip blades of any thickness up to 1/8". Conveyor speed is easily adjusted over a wide range.

A 2256

## Mail Coupon Today!

ALLIS-CHALMERS MFG. CO., MILWAUKEE 1, WIS.

**Gentlemen:**

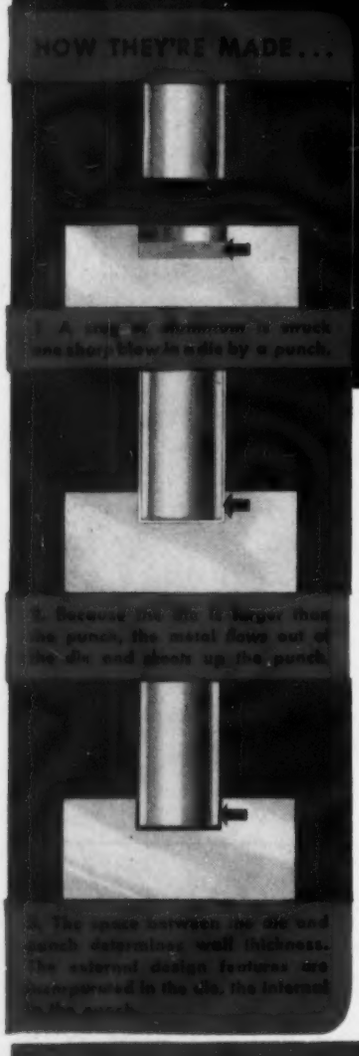
**Please send me a copy of your bulletin "Selective Heat" including application data sheet which I can fill in and send with a sample part for processing.**

**Name**.....

**Company**.....

**Street**.....

**City**.....**State**.....




## They're ALCOA Impact Extrusions

These parts show you four of the many special designs that can be made by the impact extrusion process. In the wink of an eye a slug of Alcoa Aluminum is walloped once—impact-extruded—to form the bodies of each of these parts. Then minor flanging and threading operations complete the jobs.

Almost any symmetrical shell —round, oval, or square—can be made quicker, with much greater leeway in special design features, and at lower cost by the impact extrusion process.

ALUMINUM COMPANY OF AMERICA, 2112 Gulf Building, Pittsburgh 19, Pennsylvania. Sales offices in leading cities.

**MORE people want MORE aluminum for MORE uses than ever**

# ALCOA FIRST IN ALUMINUM

IN EVERY COMMERCIAL FORM

# HYDRAULIC PRESSES

## AUTOMATIC
**FULL-HYDRAULIC**
**SELF-CONTAINED**

FROM 200 TONS UP TO THE HIGHEST CAPACITIES

SINGLE- OR DOUBLE-ACTING WITH OPPOSING RAMS

AUTOMATIC ELECTRONIC CONTROLS

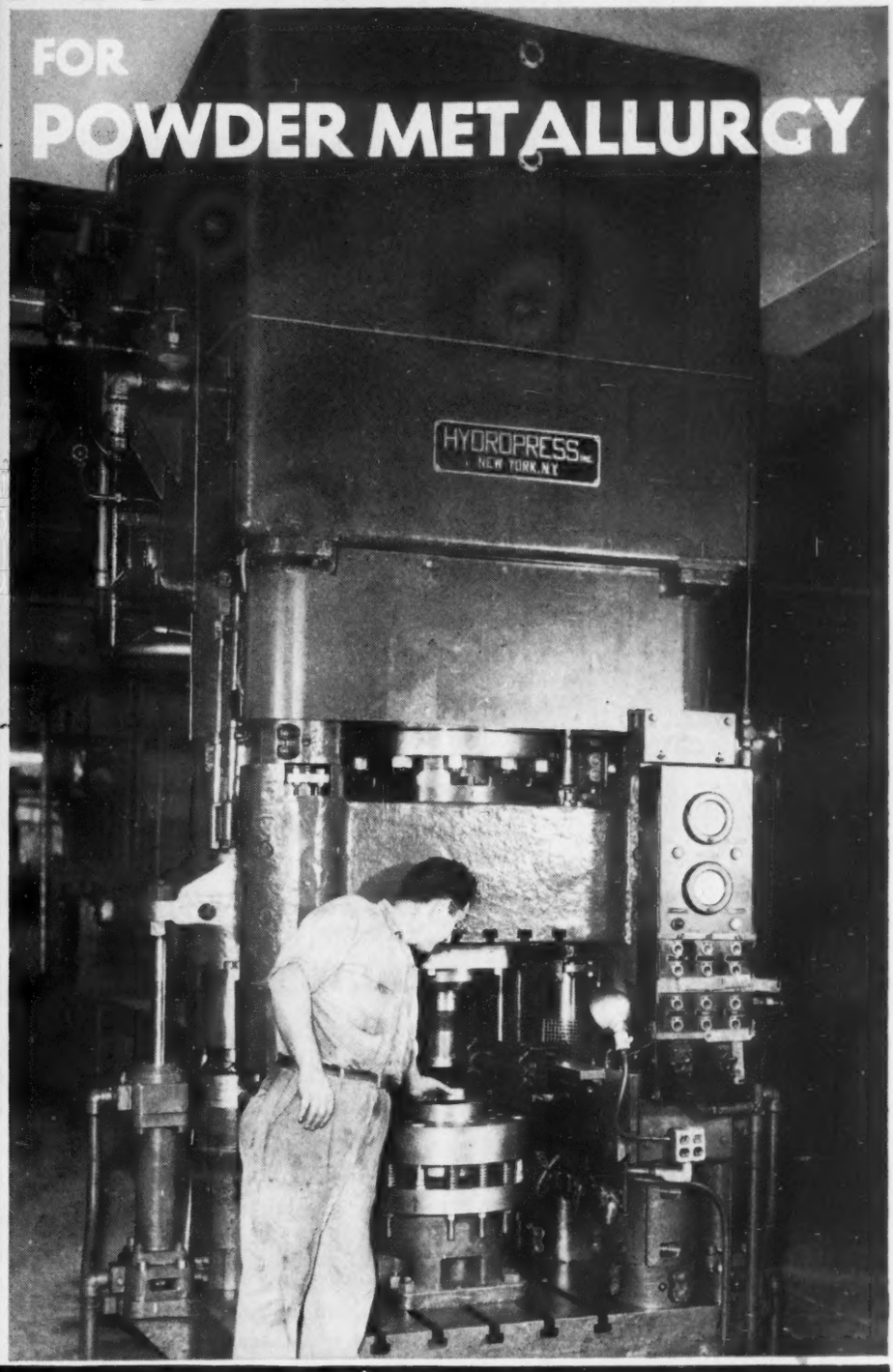
ACCURATE ADJUSTMENT AND STEPLESS VARIATION OF STROKE PRESSING SPEED ULTIMATE PRESSURE AND PERIOD OF DWELLING

AUTOMATIC FEED FOR POWDER AND PRE-FORMED PIECES

AUTOMATIC PUSH-OUT DEVICE

## ECONOMIC
**IN MASS PRODUCTION**

OF INTRICATE PARTS OF HIGH STRENGTH, HARDNESS AND DESIRED DENSITY, TO CLOSE TOLERANCES, AND WITH LITTLE OR NO SUBSEQUENT MACHINING AND FINISHING OPERATIONS




*AT RIGHT:* SELF-CONTAINED, OIL-HYDRAULIC SINGLE-ACTION PRESS OF 500 TONS CAPACITY, DESIGNED FOR THE DOUBLE FUNCTION OF PRE-PRESSING AND COINING POWDERED METAL

*AT THE AMERICAN ELECTRO METAL CORP. YONKERS, N. Y.*

# HYDROPRESS · INC.

*ENGINEERS* *CONTRACTORS*

**HYDRAULIC PRESSES · ROLLING MILLS · PUMPS**
**ACCUMULATORS · DIE CASTING MACHINES**

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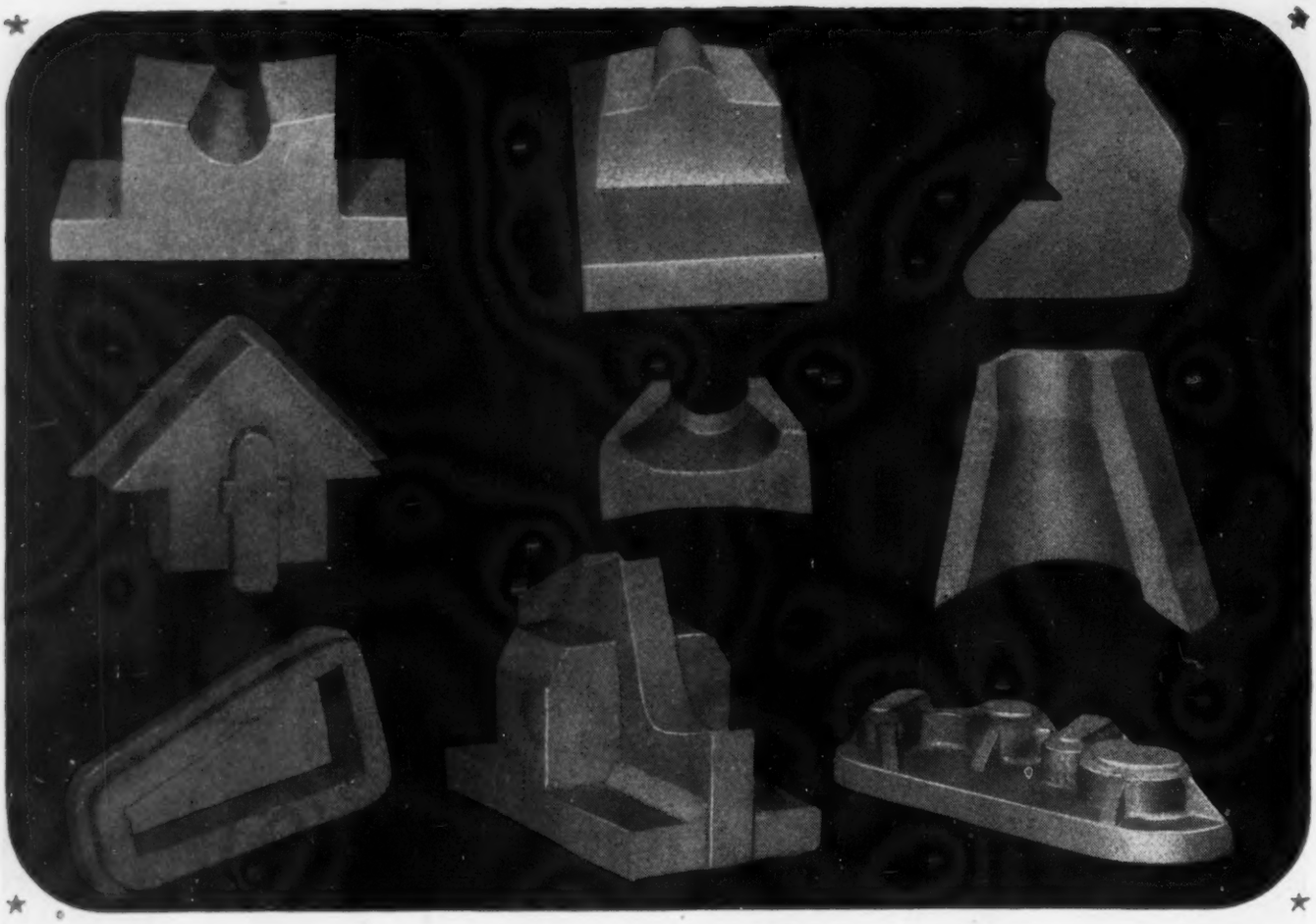

# *In this method* OF TOOL AND DIE MAKING YOU BUY LESS STEEL AND REDUCE MACHINING COSTS

*Write for New Booklet:*

**CAST-TO-SHAPE TOOL STEEL**

Gives you full details on FCC Air Hardening, Oil Hardening and other Cast-To-Shape Tool Steel Specialties capable of saving you time and money.

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**ADDRESS DEPT. S-60**

W & D 366

FCC Cast-To-Shape, the modern method of tool and die making, is effecting important savings of time, trouble and money for an increasing number of manufacturers.

Even very intricate shapes can now be cast successfully within an eighth inch of finished size. This means that you buy less steel at the start and reduce machining costs substantially.

Tools which could not be made by conventional methods except in sections can often be fabricated from FCC Cast-To-Shape blanks in a single piece.

In many instances performance of the tool is better than can be obtained by fabrication from bar stock or forgings.

Particulars are available through Allegheny Ludlum representatives; or write for the booklet today.

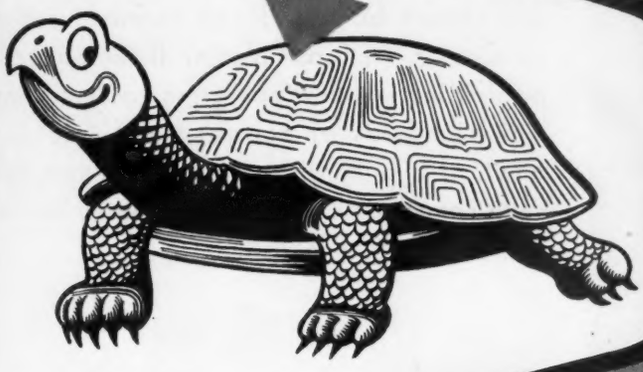
**ALLEGHENY LUDLUM STEEL CORPORATION**

***Forging and Casting Division***

**DETROIT 20, MICHIGAN**

# HY-TEST *Safety Shoes*

## PROTECTION



## WHERE NEEDED

## ...Insure Workers Feet In Sure Protection

H-711—Men's Brown Glove Moccasin Oxford, Leather Sole, Half Rubber Heel.
**Delivery at once.**

## ANCHOR FLANGE STEEL BOX TOE

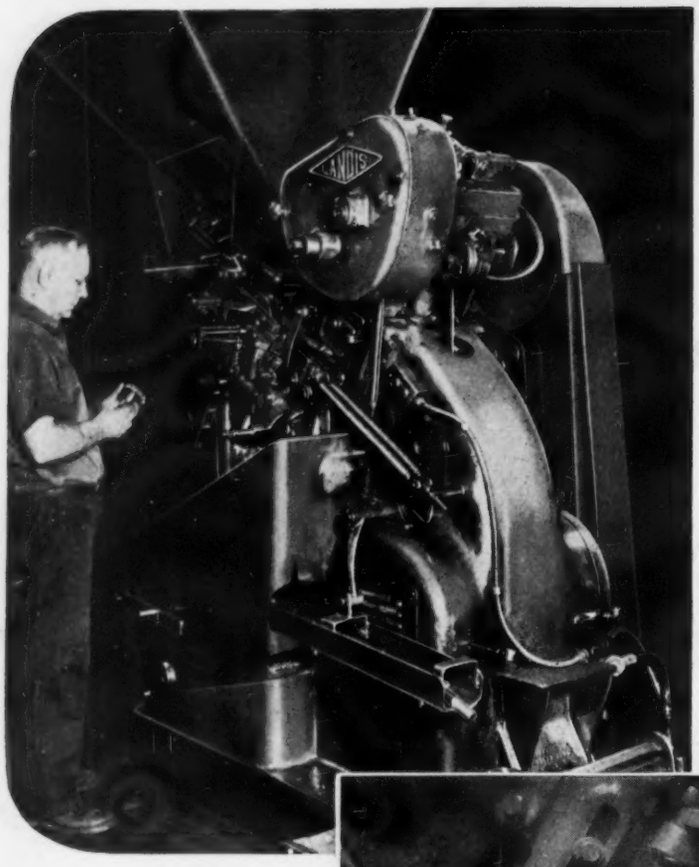
This flange adds extra strength to the steel arch's sidewall. Anchored between insole and outsole, it also serves to resist shifting and tilting when toe is struck at an angle.

Nature wisely provides the slow-moving turtle with a life-protecting shell. And just as wisely, the makers of Hy-Test Safety Shoes provide a shell of steel in Hy-Test Shoes to give *protection where needed.* This Anchor-Flange Steel Box Toe defies falling objects and other toe-injuring hazards. It is scientifically arched to take the blows... specially anchored to hold firm without shifting or tilting. This sturdy shell of steel is so smoothly patterned into Hy-Test's trim, neat lines you hardly know it's there.

Yet, like other outstanding features it helps distinguish these shoes t make them preferred by more work ers than any other safety shoe i America. Husky, pliant leathers *Slant-eze* tops for ankle freedom and quality workmanship through out assure longer wear, extra com fort, and neat appearance in th safety shoe that gives *protectio where needed.* Would you like t know how Hy-Test's pla can bring these shoes t workers in your plant? Jus drop us a line.

# HY-TEST *Safety Shoes*

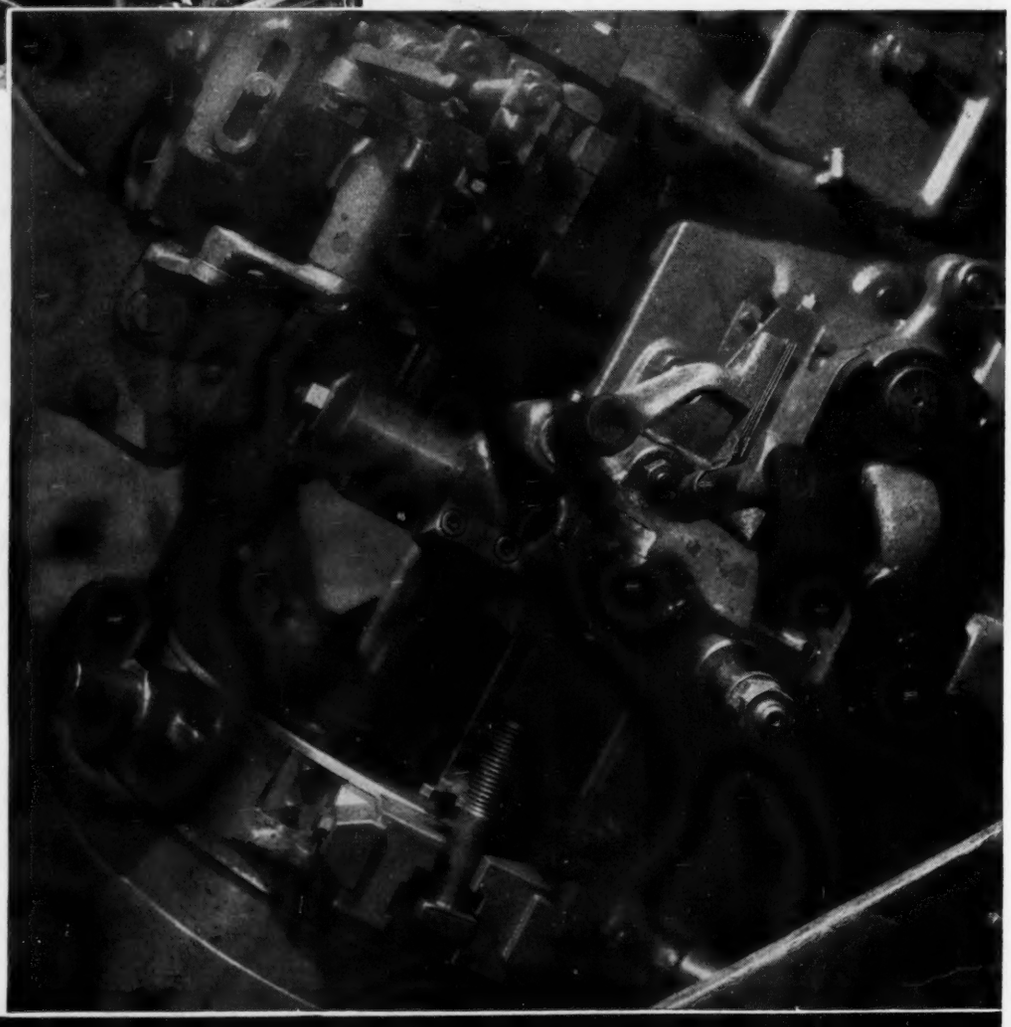
THE WORLD'S LARGEST SELLING SAFETY SHO
HY-TEST DIVISION • INTERNATIONAL SHOE COMPANY • ST. LOUIS 3, MO
EASTERN OFFICE • MANCHESTER, N. H.



# *More Bolts..*
# PER HOUR, PER MAN

The LANDIS Automatic Forming and Threading Machine illustrated is a fully-automatic threading machine designed to point to length and thread bolts and cap screws from cold headed or hot forge blanks. It combines high production with low operating cost, and meets high standards of accuracy and safety. The machine is built with semi-vertical spindles to save space, and one man can easily service a battery of eight machines.

LANDIS TRADE MARK REG. U.S. PAT. OFF.



## *. . . . from 750 to 1800 bolts per hour!*

• Bolt blanks are dumped continuously into the hopper (as illustrated). The operation is then automatic until the finished bolts are ejected into an oscillating conveyor carrying them to a container.

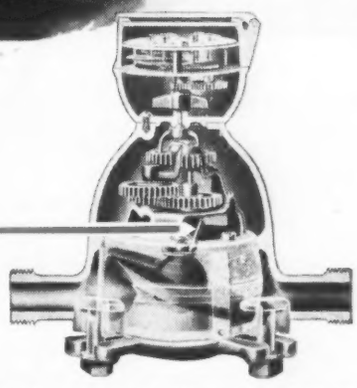
Short set-up time is ideal for short runs—a change in thread length in five minutes, in bolt length in 10 minutes, in speed in 2 minutes—a complete change in diameter, pitch, thread length, and bolt length in 40 minutes.

Output varies with bolt diameter and thread length—786 5/8" bolts in one hour, with more than 10,000 threads per chaser grind—more than 1,000 7/16" 20 pitch N.F. cap screws of alloy steel in one hour, to Class 3 specifications.

***Write For Bulletin No. E-70***

# LANDIS MACHINE CO.
## WAYNESBORO, PA., U. S. A.

## RIVERSIDE PHOSPHOR BRONZE HELPS KEEP THE RECORD STRAIGHT . . .



Sectional View of Worthington-Gamon Watch Dog Disc Water Meter. Spindles and pinions are made of *Riverside Phosphor Bronze.*

• Your Uncle Sam (We Americans) consume billions and billions of gallons of water every year. Water meters need herculean stamina to stay on the job 24 hours a day year after year accurately measuring all this water. Water has tremendous solvent powers (it even eats away hard rock), and it is a potent corrosive agent. Therefore component parts of a water meter must be made of the finest non-corroding materials obtainable.

Worthington-Gamon Meter Company, a cardinal producer of water meters (see above) use *Riverside Phosphor Bronze* for spindles and pinions, vital parts, which are subject to arduous punishment.

*Riverside Phosphor Bronze* has exceptionally high resistance to wear and to corrosion in dampness, fumes and salt and acid waters. It will not rust and it has a low coefficient of friction, presenting a good bearing surface.

*Riverside Phosphor Bronze's* advantages enable designers to plan better, more efficient products and effect many production economies. Investigate this remarkable alloy now and also get the story on *Riverside Nickel Silver* and *Beryllium Copper.* Write for catalogs.

### INSIDE RIVERSIDE

Antidote Department: It'll take more than an ice bag to cure lead time headaches in the metal industries but—keep your fingers crossed—there is hope. We're still not boasting about our own lead time, but if you need something special in our field, count us *in* before you count us out. We may be able to help you.

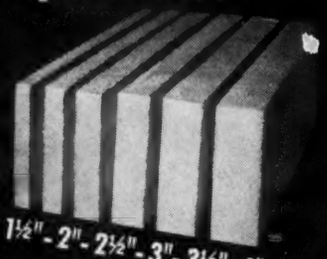
RIVERSIDE

THE
**RIVERSIDE METAL COMPANY**
NEW YORK CHICAGO RIVERSIDE • NEW JERSEY HARTFORD CLEVELAND

# Industry's Standard for 20 Years

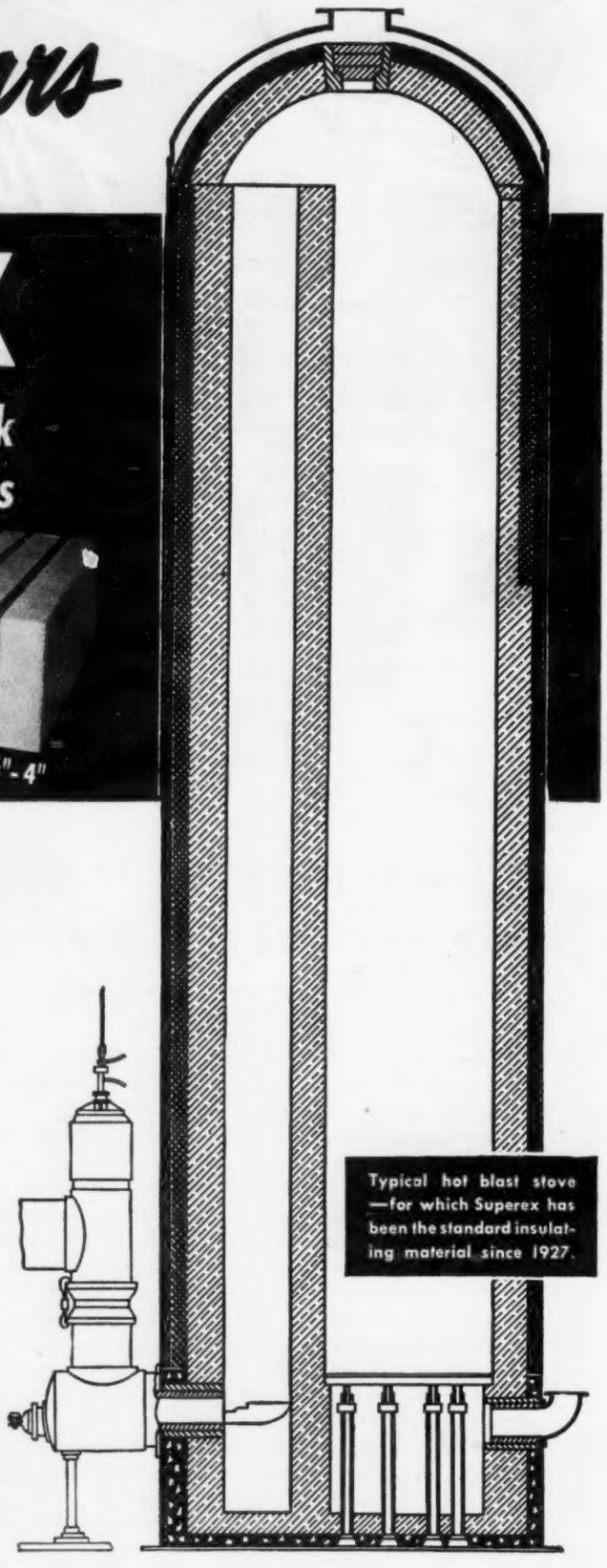
## SUPEREX

**consistently leads all block insulations for temperatures up to 1900 F.**



Superex blocks are finished in various standard sizes and thicknesses.

1½"-2"-2½"-3"-3½"-4"



Typical hot blast stove —for which Superex has been the standard insulating material since 1927.

Superex has been the standard block insulation for temperatures up to 1900 F for over 20 years—used on more industrial high-temperature equipment, behind refractory linings, than any other block type of insulation.

Superex attained this success because it alone provides all these outstanding advantages:

**1. Low-Thermal Conductivity**—Superex is made from specially selected calcined diatomaceous silica, bonded with asbestos fibre—presenting a formidable barrier to the passage of heat.

**2. High-Heat Resistance**—J-M Superex Blocks safely withstand temperatures up to 1900 F without deterioration.

**3. Light-Weight**—Approximately 24 lbs. per cu. ft.

**4. High Physical Strength**—Withstands vibration and other physical abuse encountered in normal service. Approximately 5 tons pressure per square foot are required to compress Superex ⅛ inch.

**5. Permanent Efficiency**—Superex maintains high thermal efficiency indefinitely—will not disintegrate in service for which recommended.

**6. Quick Application**—The convenient sizes and light-weight of Superex assure fast, economical installations.

**7. Easy Cutting and Fitting**—Superex is easily cut with an ordinary knife or saw for fitting around openings or irregular surfaces.

Special shapes and curved blocks—in addition to the 6 standard thicknesses illustrated—can be supplied. Write Johns-Manville, Box 290, New York 16, N. Y.

JM PRODUCTS

## JOHNS-MANVILLE *First in* INSULATIONS

*"pretty as a picture"*

**the way you can lithograph, enamel and lacquer**

# WEIRITE

*Electrolytic Tin Plate*

Products made from Weirite Electrolytic Tin Plate have plenty of eye-appeal on the nation's counters. Its uniform, fine-texture surface is well suited to all kinds of colorful merchandising dress.

Recommended for dry-packed containers—for cannisters, closures and light toys . . . Weirite Electrolytic Tin Plate is the most economical form of rustproof metal you can use.

Other Weirton tin mill products are Weirite Hot-Dip Tin Plate for liquids and foodstuffs requiring high corrosion-resistance, and Weirite Tin Mill Black Plate.

## WEIRTON STEEL COMPANY

WEIRTON, W. VA. *Sales Offices in Principal Cities. Division of* NATIONAL STEEL CORPORATION *Executive Offices, Pittsburgh, Pa.*

You figure the *savings* in Dollars and Cents...

Here's what you *save* in Time

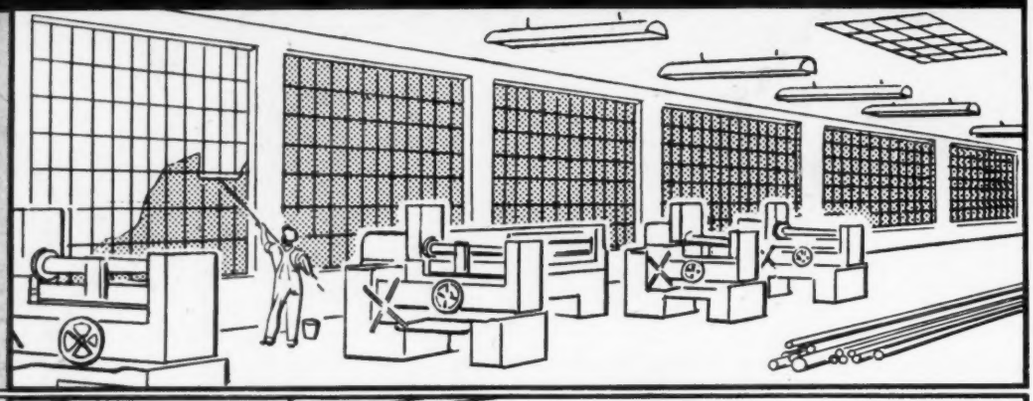
# Cleaning Windows·Skylights·Walls·etc.

## WITH HYPRESSURE JENNY STEAM CLEANER

**OLD WAY**

**1 MAN**

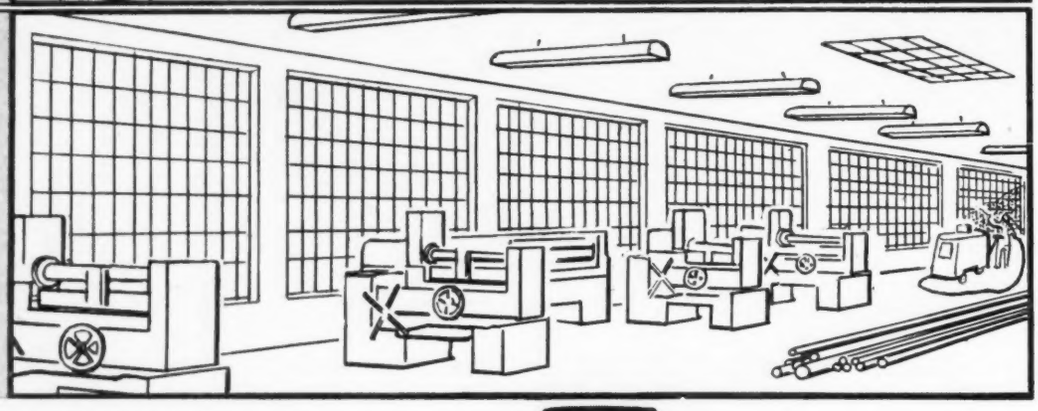
**10 HOURS**



**HYPRESSURE JENNY WAY**

**1 MAN**

**1 HOUR**



Your mill or factory ribbed-glass windows and skylights can be kept clean—sparklingly clean—to promote faster, safer operations, in just *one tenth* the time it now takes to clean them by hand. This means a saving of 90% on your cleaning bill; for 1 man with Hypressure Jenny can do more cleaning than 10 men working with mop, brush or broom. Add to this economy an additional saving of 40% in man hours when machines are Hypressure Jenny steam cleaned *before* repairs . . . the production time saved by getting machinery back into service faster . . . the many other time and labor saving cleaning jobs Hypressure Jenny will do . . . and you can understand why hundreds of users say Hypressure Jenny pays for itself many times over in the course of a year.

Let us send you full particulars. Write today.

. . . is portable . . . compact . . . safe . . . so easy to use that common labor can operate it. Cleaning is accomplished by a highly atomized mixture of steam, hot water and cleaning compound applied under pressure through an adjustable spray gun.

**HYPRESSURE JENNY DIVISION**

**HOMESTEAD VALVE MANUFACTURING CO.**

**P. O. Box 22 Coraopolis, Pa.**

# VACUUM CLEANER FOR HARBOR FLOORS

## Another top performance by a BWH product

Keeping harbors safe for shipping is a tough, never-ending job. It calls for dredges to scoop up sand, mud, stone and other channel debris. The dredge's suction hose takes a real beating, because such highly abrasive materials pass through it constantly. What's more, the job must often be done in the face of strong variable winds and changing tides that buffet the vessel and subject the hose to severe strain.

No wonder the owner of a commercial dredging fleet was plagued by hose replacement problems . . . until he called on BWH for help.

Our engineers recommended Perfection Sand Suction Hose, designed especially for the hardest service. The tube through which all dredged materials must pass is made of the toughest, high-grade, wear-resistant rubber, tested for durability . . . in gauges to meet any operating needs.

An open-weave breaker strip fabric firmly welds rubber tube and carcass. To give the hose flexibility, a high-tensile spring steel wire is spirally embedded in the rubber. Plies of rubberized duck hold the wire firmly in place, and contribute to the general strength of the hose.

As a companion to Perfection Suction Hose, BWH recommended a Paramount wire-reinforced Dredge Discharge Sleeve. Used as the first connection between pump and pontoon line, the sleeve absorbs strain and prevents kinking. This worked perfectly. Hose and sleeve have now been in operation for a long period . . . proof of the economy of quality hose.

Perfection Sand Suction Hose is just one of the many quality products manufactured by BWH. Whatever your need for industrial rubber goods, look to BWH for dependable ruggedness . . . BWH distributors for dependable service.

### HAVE YOU A JOB WHERE STAMINA COUNTS?

Bring us your toughest problems . . . we're specialists in solving them. Consult your nearby BWH distributor, or write direct.

**BOSTON WOVEN HOSE & RUBBER COMPANY**

Distributors in All Principal Cities

WORKS: CAMBRIDGE, MASS., U. S. A. • P. O. BOX 1071, BOSTON 3, MASS.

# IT'S LIKE PIPING AIR FROM THE POLAR ICE CAP

## Year 'round dew point of -60° F.

Your processes don't have to suffer from seasonal heebie jeebies caused by high humidities. Feed dry air into your plant and have "winter weather" the year around.

Lectrodryers deliver all the dry air you need, at dew points as low as −100° F., if necessary. Working with automatic controls, they maintain constant humidities in workrooms, equipment and warehouses.

***What's your humidity problem?***

Tell us where you need dry air, in what volume and at what dew point. Our engineers will recommend the cure. Quite likely, there's a standard Lectrodryer ready to step out of the catalog and handle the job for you.

Write Pittsburgh Lectrodryer Corporation, 323 32nd Street, Pittsburgh 30, Pennsylvania.

**In England: Birlec, Limited, Tyburn Road, Erdington; Birmingham.**
**In Australia: Birlec, Limited, 51 Parramatta Road, Glebe, Sidney.**

Type CH Lectrodryer

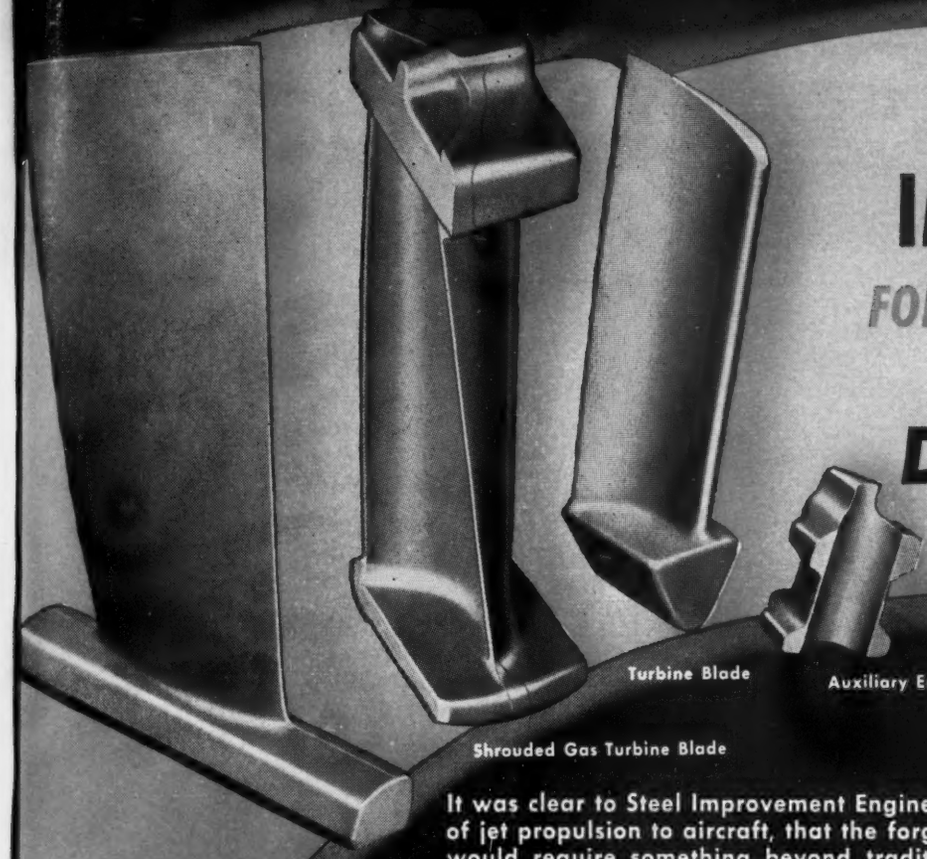
**LECTRODRYERS DRY WITH ACTIVATED ALUMINAS**

# LECTRODRYER

REGISTERED TRADEMARK U.S. PAT. OFF.

# STEEL IMPROVEMENT

## FORGED TURBINE BLADES ARE ALWAYS Dependable



Turbine Blade

Auxiliary Engine Turbine Blade

Shrouded Gas Turbine Blade

Axial Flow Compressor Blade

It was clear to Steel Improvement Engineers, at the initial stage in the application of jet propulsion to aircraft, that the forging of turbine blades, buckets and wheels would require something beyond traditional forging techniques. There followed the immediate adoption of an attitude in which the urge to pioneer, to persist in the effort to discover and establish correct techniques for forging high temperature alloys to close tolerances, was given the utmost freedom of action. Responding to the irrepressible urge to forge correctly these essential parts, funds were generously appropriated at the beginning to obtain or develop suitable equipment and to conduct experimental forging. Success crowned this effort. Thousands of these vital parts have been formed of the new high temperature alloys by drop forging to close tolerances. On the basis of long experience in forging intricate designs, and of the specialized metallurgical and engineering skill acquired, it is now possible for Steel Improvement Forging Engineers and Metallurgists to: (1) know the exact forging technique that should be utilized for developing fully the qualities, inherent in the alloy, that are required to meet the high stresses occurring in modern aircraft engines; (2) avoid costly experimentation in forging, heat treating and machining blades, buckets and wheels; (3) advise and assist designers regarding the correct placement of parting lines and other design elements; and (4) adhere strictly to a policy of projecting a promise only when the accomplishment of the work can be substantiated by fact or experience or both.

## THE VITAL ELEMENT IN THE IMPROVEMENT OF METALS BY FORGING IS MEN!

Backed by over 33 years of forging production experience, Steel Improvement Engineers and Metallurgists have under their direction complete facilities for performing the highly specialized work of forging, heat treating and machining turbine blades, buckets and wheels of high temperature alloys. These facilities constitute a Turbine Forgings Division, the authority and responsibility of which encompasses all required phases of engineering, metallurgy, production and inspection to assure you dependable forgings.

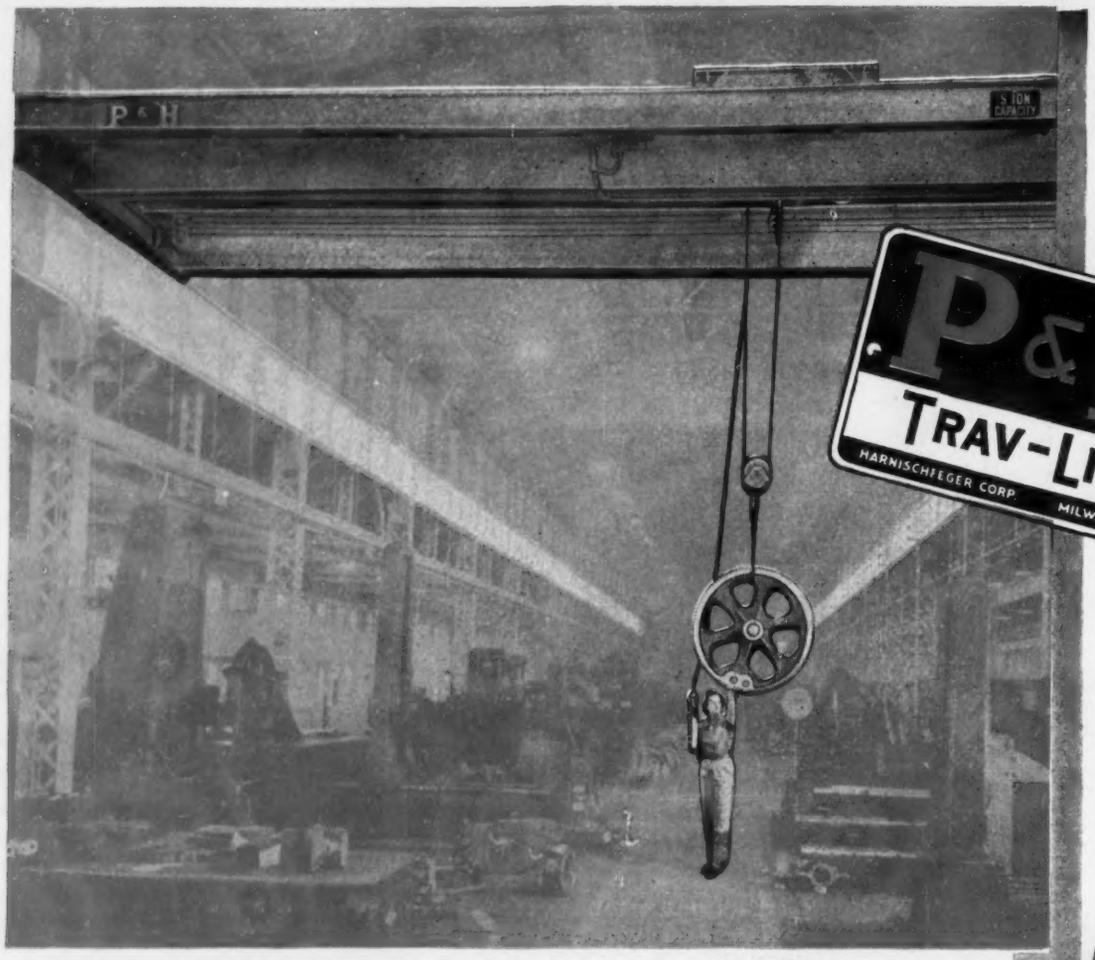
*Turbine Forgings Division*

DROP FORGINGS

**THE STEEL IMPROVEMENT & FORGE CO.**

942 East 64th Street CLEVELAND, OHIO

*Sales Offices:* New York • Chicago • Milwaukee • Tulsa • Los Angeles




# TAKE THE "MUSCLE" OUT OF MOVING

## with "THRU-THE-AIR" handling!

It doesn't pay to "sweat" loads here and there—not when push buttons do it for less!

"Thru-the-air" handling, as typified by P&H Trav-Lift Cranes, saves time and money on every move. Without effort, without delay, it moves any kind of load from any point to any other within the area served. And every action of the load—lifting, moving, lowering—is accurately controlled by the operator's thumb!

Where handling needs are varied, and service intermittent, there is no surer way to cut costs than with P&H Trav-Lift Cranes. Available with floor or cage control, capacities up to 15 tons. See bulletin at right.

*See how others are profiting with P&H Trav-Lifts. Forty pages of application pictures and complete specifications — in your free copy of Bulletin H13-1.*

### The *"Extras"* Are STANDARD EQUIPMENT, Added Values on P&H Trav-Lift Cranes

- Shaved gears for lifetime service . . . all bearings grease-sealed.
- Thermal overload protection against motor burn-outs . . . twin brakes for extra safety.
- Motors specifically designed and built by P&H for crane service . . . hoisting, trolley, bridging.
- Effortless push-button control . . . available for all motions and with variable speed feature.
- Transformer provides 110 volts at push-button.
- P&H's true motor ratings assure against failure at full capacity loads and speeds.

**P&H**

**ELECTRIC HOISTS**
4411 West National Avenue
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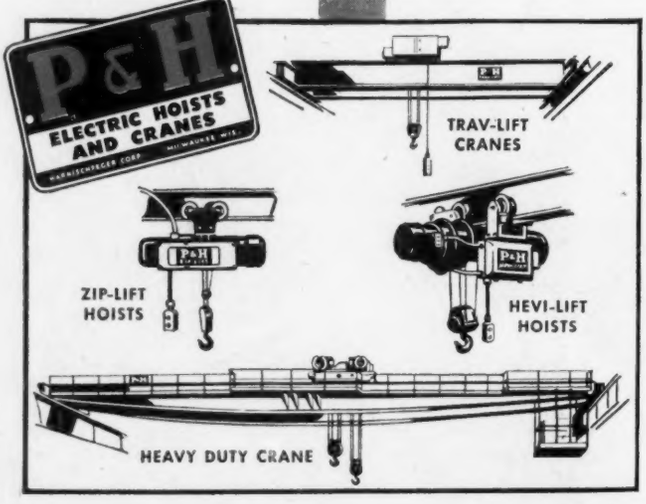
**HARNISCHFEGER CORPORATION**
ELECTRIC CRANES • EXCAVATORS • ARC WELDERS P&H HOISTS • WELDING ELECTRODES • MOTORS



# For HEAVIER FEEDS at HIGHER SPEEDS

Drilling a single hole in a forged brake lever, as shown in the photo, is not a difficult operation. Yet even in this case, *cost per hole* has been the determining factor in selecting the proper drill for the job. ◈ On this basis you will find that CLE-FORGE High Speed Drills give you maximum results at minimum cost. Because these drills consistently take heavier feeds at higher speeds, they produce holes at lower cost.

*Telephone your* I S D INDUSTRIAL SUPPLY DISTRIBUTOR

The CLEVELAND TWIST DRILL COMPANY
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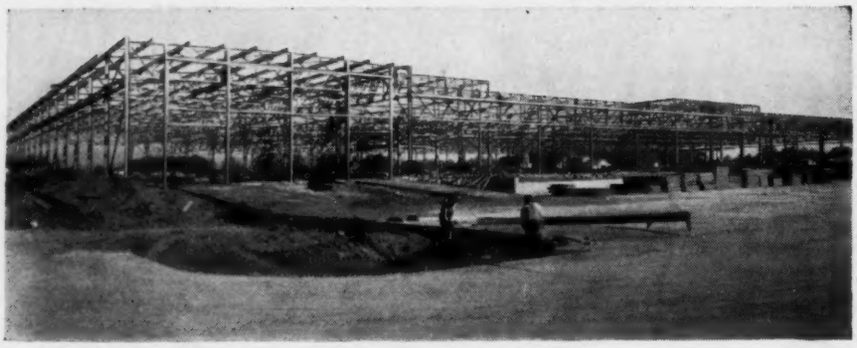
**FORD**

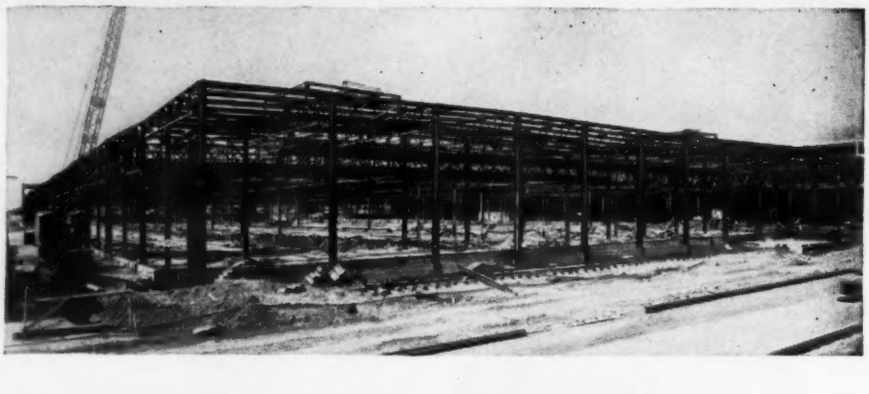


Ingalls fabricated steel used in the new Ford assembly plant at Hapeville, Ga.

**GENERAL MOTORS**

. . . and in this addition to General Motors' Harrison Radiator Division, Lockport, N. Y.

**CHRYSLER**



. . . and in the new Dayton, Ohio plant for Chrysler Corporation's Airtemp Division

# AS INDUSTRY GROWS . . .

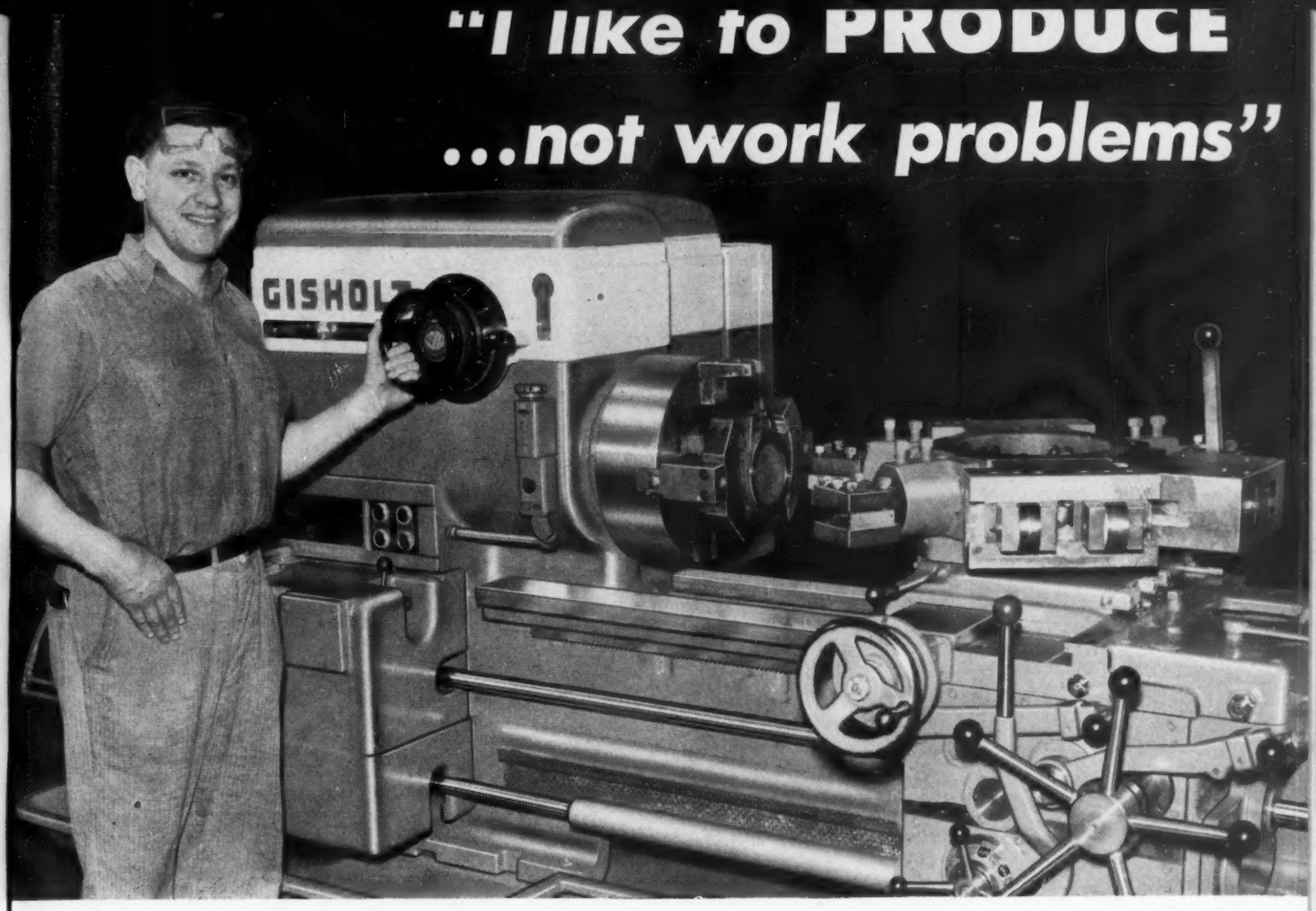
Ingalls fabricated steel is the framework for many of the nation's new and expanded manufacturing plants. Steel bearing the Ingalls label is thoroughly dependable. Formed to exact specifications, it requires a minimum of cutting or fitting on the job.

If fabricated steel figures in your construction plans, contact Ingalls at once. We will gladly submit quotations.

THE INGALLS IRON WORKS CO., THE INGALLS SHIPBUILDING CORP., The Steel Construction Co., Birmingham Tank Co. Fabricating plants at Birmingham and Pittsburgh. Shipyards: Pascagoula, Miss., and Decatur, Ala. Offices: BIRMINGHAM, Pittsburgh, New York and New Orleans.

**INGALLS**
STEEL

# "I like to PRODUCE ...not work problems"




# the GISHOLT Speed Selector *does the figuring!*

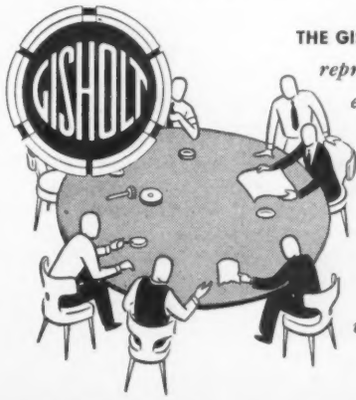
No wonder turret lathe operators like the Gisholt Speed Selector. ***Without it, here is what they have to do to get the proper spindle speed:***

1. Take the diameter to be cut and multiply it by 3.1416 to get the circumference.
2. Refer to tables to get the proper cutting speed in feet per minute for the material, based upon depth of cut, tooling and feed.
3. Divide cutting speed by circumference at cutting point to figure the proper spindle r.p.m.
4. Get the spindle revolving at that speed by means of manual control.

***All this the Gisholt Speed Selector eliminates.*** The operator merely turns the hand wheel to the diameter of the cut. The machine automatically responds with the proper spindle speed.

Nobody wants to do it the hard way any more. That's why the Speed Selector is now standard equipment on Gisholt Turret Lathes.

**THE HYDRAULIC SPEED SELECTOR,** *now standard on Gisholt Turret Lathes, is another important improvement in the interests of greater production and lower machining costs. Ask for complete information.*




**THE GISHOLT ROUND TABLE** *represents the collective experience of specialists in the machining, surface-finishingandbalancing of round and semi-round parts. Your problems are welcomed here.*

## GISHOLT MACHINE COMPANY

Madison 3, Wisconsin

*Be sure to see all the new advancements in the big Gisholt exhibit at the Machine Tool Show*

1947 MACHINE TOOL SHOW CHICAGO

**TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES**

# CALL ON B&W for...

## ...a short-cut to tough, hard parts

**PROPERTIES**

| | Nitralloy No. 135 Type "G" |
|---|---|
| Carbon | .30 — .40 |
| Manganese | .40 — .60 |
| Silicon | .30 — Max. |
| Chromium | .90 — 1.40 |
| Aluminum | .90 — 1.40 |
| Molybdenum | .15 — .25 |

| | Nitralloy No. 135 "Modified" (Aircraft Spec.) |
|---|---|
| Carbon | .38 — .45 |
| Manganese | .40 — .70 |
| Silicon | .30 — Max. |
| Chromium | 1.40 — 1.80 |
| Aluminum | .95 — 1.35 |
| Molybdenum | .30 — .45 |

NITRALLOY seamless tubing will save you considerable time, costs and materials in machining hollow cylindrical parts in which you require great resistance to wear, seizure or abrasion along with toughness and high durability. After the Nitriding process, Nitralloy parts combine a high surface hardness (960-1140 Vickers) with a comparatively soft and resilient inner core. They do not lose their hardened case even at temperatures up to 750F.

The unique combination of properties in this tubing make it an ideal material for making scores of different tough, hard parts...from aircraft engine liners to husky wrist pins.

Two grades of Nitralloy tubing are available for mechanical uses—135(Type G) and 135(modified). Send for complete technical data on this latest addition to B&W's wide selection of Seamless and Welded Mechanical Tubing.

TA 1399M

Other B&W Products

**THE BABCOCK & WILCOX CO.**
85 LIBERTY STREET • NEW YORK 6, N. Y.

Water-Tube Boilers, for Stationary Power Plants, for Marine Service • Water-Cooled Furnaces • Superheaters • Economizers • Air Heaters • Pulverized-Coal Equipment • Chain-Grate Stokers • Oil, Gas and Multi-fuel Burners • Refractories • Process Equipment.

**BABCOCK & WILCOX SEAMLESS & WELDED TUBES**
THE BABCOCK & WILCOX TUBE COMPANY
GENERAL OFFICES: BEAVER FALLS, PA.
PLANTS: BEAVER FALLS, PA. AND ALLIANCE, OHIO.

# There's going to be a fight and you can use knives!

. . . it's going to be a fight to beat off tough competition. And cutting production costs is one way to do it!

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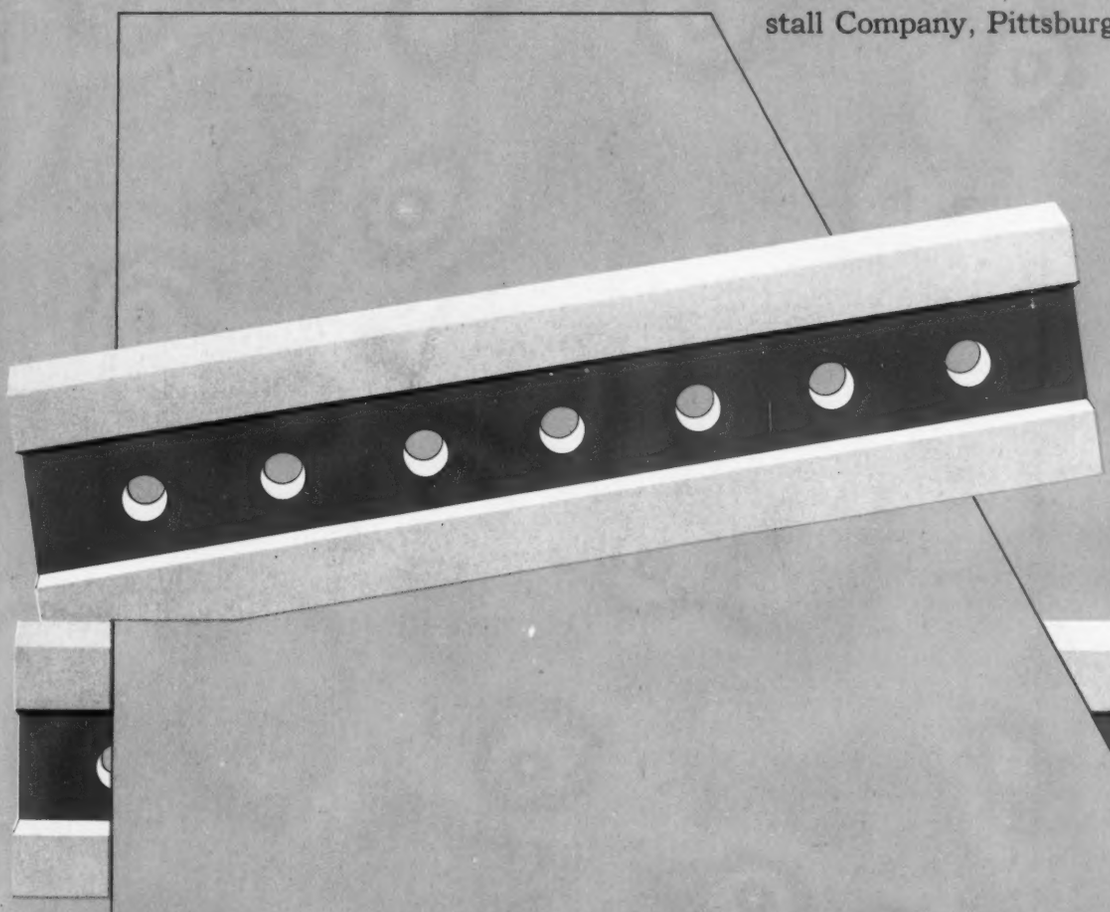

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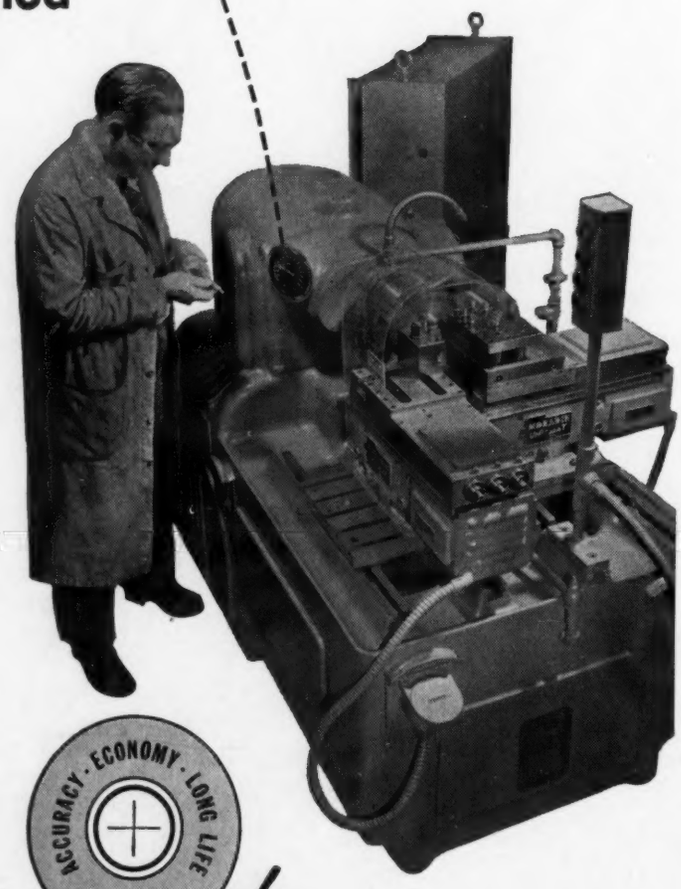

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**NEXT WEEK . . .**

Cutting Costs, Increasing Output with Modern Machine Tools—Milling
Gas Chemistry in Metallurgy
Quality Control and Competition
Three-phase Welding
New Metallurgical Developments


# STEEL

***The Magazine of Metalworking and Metalproducing***

VOL. 120, NO. 26 JUNE 30, 1947


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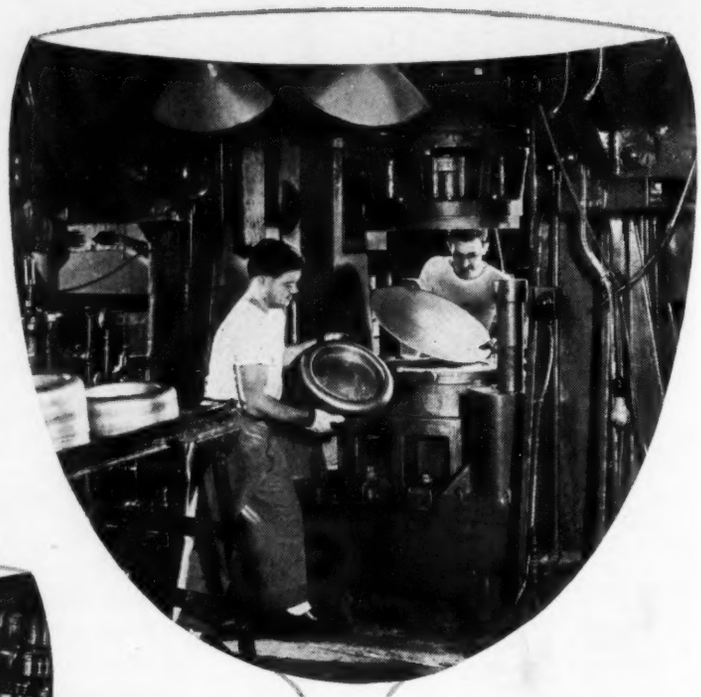
# *You Can Draw More than Beer*

## from these STAINLESS STEEL BARRELS...



**STAINLESS STEEL SIMPLIFIES PRODUCTION . . .** The high ductility of "18-8" makes severe drawing operations easy. Here, one man places a stainless steel blank in the press, while the other stacks a stamping.

**COMPONENT PARTS OF BARRELS ON WAY TO WELDERS . . .** Tops, shown at left, bottoms, at center, and middle sections, on upper right, move on huge conveyor belts to welding department, to be joined together into a finished Firestone product.

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June 30, 1947

# Fair Deal

In appraising the significance of the Taft-Hartley Act it will be well to pay major attention to the general objective which prompted both houses to override the President's veto rather than to dwell at length upon the merits of specific provisions of the law.

The cold facts which lie behind the enactment of this corrective legislation are essentially as follows: On July 5, 1935, President Roosevelt approved the Wagner Act. It was a one-sided document, drafted in a spirit of spite and passed in an atmosphere of public resentment against those who were believed to be responsible for the depression.

One-sided, discriminatory administration of the act made it go much farther than many of the lawmakers who voted for it had intended. In time, the act encouraged certain union leaders to abuse their newly-won authority. As abuses and arrogance increased, the public gradually came to a realization that the Wagner Act was making the unions too powerful and that corrective legislation was needed that would restore a fairer balance of power and would better protect the public interest.

The public voiced its demand for these correctives in last November's elections. After long deliberation, Congress responded to this mandate by passing the Taft-Hartley bill with overwhelming majorities in both houses.

Then President Truman and many union leaders made the great mistake of forgetting the environment in which the drama of enacting the legislation was being played. Just as the Liberty Leaguers and many die-hards underestimated the zeal of the public for reforms in the thirties, so did Messrs. Truman, Murray, Green and others a week or more ago underestimate the determination of the American public to curb union labor excesses. For this reason, the unprecedented campaign to stampede Congress into sustaining the ill-considered veto failed.

One can easily understand that President Truman and the ranking officials of the labor movement are bitter in their defeat. However, they can gain some consolation from the knowledge that in no other large nation in the world could they have fared as well as they have here. In Russia there can be no union movement. In England and in many other nations the dramatic events of June 23 would have caused Mr. Truman and his administration to step down and the party of Messrs. Taft and Hartley to assume control.

Smart, intelligent labor chieftains probably know inwardly that they have been given an extraordinarily fair deal.

**SANER DEPRECIATION:** Speaking at the annual meeting of the Machinery & Allied Products Institute, Herbert H. Pease, president of New Britain Machine Co., presented strong arguments for a more realistic handling of depreciation on fixed assets.

He pointed out that the depreciation allowed currently by the Treasury Department falls far short of providing the reserves necessary to replace obsolete equipment. This point has been emphasized by many industrialists during recent months. However, Mr. Pease advocates a new approach. He would examine the problem from the standpoint of tax revenue received by the federal government.

Assume that manufacturers could write off 100 per cent of the cost of a machine annually. Assume also that in a given year $250 million of machine tools were installed in American shops. The 100 per cent write-off would permit $250 million to be entered as expense and the government would lose approximately 38 per cent of this or $95 million in tax revenue. To make up this deficiency, the government could borrow $95 million at 1 per cent, or $950,000.

However, permission to depreciate machinery and equipment 100 per cent annually would encourage

(OVER)

the replacement of obsolete equipment so potently that plant efficiencies would rise spectacularly and eventually the increased profits of manufacturers would yield tax revenues far exceeding the initial loss of $95 million.

This approach to depreciation merits careful study. —p. 48

° ° °

**OPPORTUNITY ABROAD:** Charles A. Koons, head of a New York house engaged in exporting and importing steel products and equipment, believes that export by American producers and manufacturers of rails, railroad equipment, machinery and tools to friendly nations within the next few years may do more to stem any tendencies toward undemocratic "isms" than propaganda and preaching.

He points out that the United States is the only major nation now able to supply the products and equipment that these countries require if they are to build self sustaining economies. He places great emphasis upon the importance of rails and railroad equipment, because in many countries transportation facilities must be provided before any marked progress in improving the economy can be made. He thinks that such assistance as we can give now will cement relationships that will stand us in good stead in the difficult decades ahead.

The opportunities which Mr. Koons envisions undoubtedly will interest American manufacturers who are actual or potential exporters. —p. 47

° ° °

**BUYERS' MARKET CURE:** Perusal of testimony presented before the Steel Subcommittee of the Special Senate Committee To Study Problems of American Small Business makes one wonder just what Congress can do to remedy conditions.

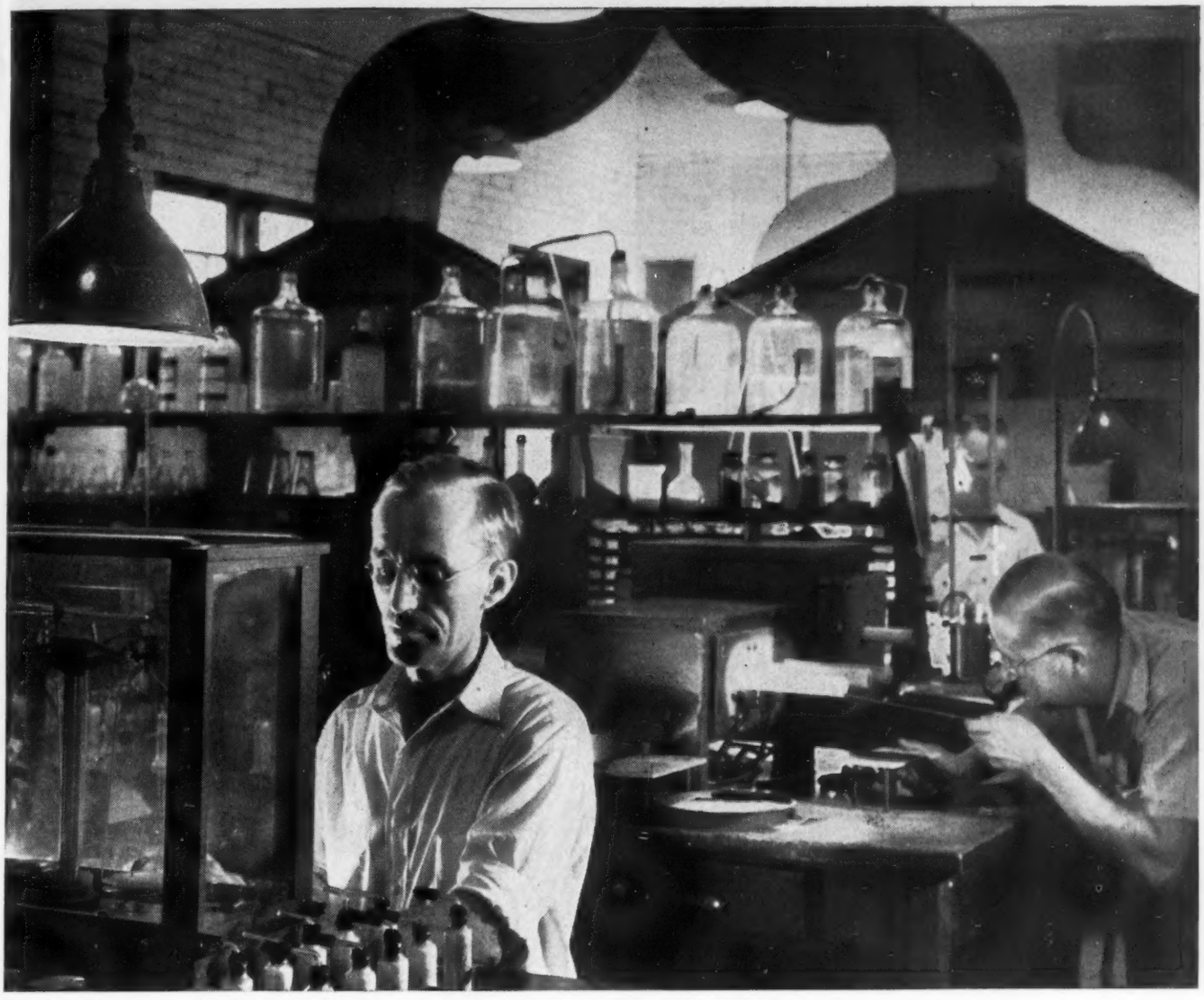
The evidence corroborates the well known scarcity of steel, existence of gray markets, reluctance of producers to serve customers far distant from basing points, captivation of facilities which once catered to open market demand and many other unfortunate aspects of the present situation. The publicity given to these conditions probably exercises a constructive influence and it is quite possible that from the information gained in the hearings ideas for corrective legislation may develop eventually.

However, one wonders whether either of these factors can be as effective or as prompt in producing results as the return of a buyers' market. Few of the conditions of which customers complain today could prevail in a period when sellers were compelled to hustle to get orders. —pp. 35, 40, 113

**SIGNS OF THE TIMES:** Business failures in May totaled 378, highest in any month since March, 1943. Nearly half were in companies with liabilities ranging from $500 to $25,000 (p. 56) and 155 or 40 per cent were engaged in manufacturing. . . . In the New Orleans plant of Higgins Industries Inc., motor propeller fans and power roof ventilators are turned on in the evening as soon as the outdoor temperature goes down (p. 80) and are turned off early in the morning. Heat, odors, dust, steam and other unwanted air contaminants are driven out as night air is drawn in. Inside temperature is lowered as much as 20° and the atmosphere is fresh and inviting when the day shift comes to work. . . . Railroads are opposing vigorously the Lemke bill which provides for taking car distribution away from the railroads and giving it to the Interstate Commerce Commission. "If this is done," said a railroad spokesman (p. 44), "it is the beginning of the end of private operation of the railroads". . . . Col. H. A. Toulmin Jr., president of Hydraulic Press Mfg. Co., writes in the company's house organ that too many manufacturers run the danger of seeing their cherished products subside into industrial relics because they have become too proud of their products and too attached to their equipment. Far wiser, in his opinion (p. 49), is the manufacturer who "brings out new models in advance of demand and creates for his aggressive company the first market on a recurrent basis". . . . Carnegie Institute of Technology has received funds enabling it to go ahead with plans (p. 54) to build a 200 million volt synchro-cyclotron. . . . Guy Hubbard's fourth article in the series on the importance of machine tools to modern industry (p. 64) deals with surface machining as performed by planers, shapers and slotters. . . . It is estimated that the automobile industry is producing 2,500,000 cars and trucks during the first half of 1947. Assuming that production for third quarter holds to the current level and that a slight increase in the fourth quarter is possible (p. 51), total assemblies for the year will exceed 5,000,000 vehicles. The proportion of trucks to total output, approximately 25 per cent, is the highest on record. . . . Tightest steel product today is galvanized sheets. An analysis of the situation (p. 35) indicates they may be the last of the flat-rolled steels to enter a buyers' market.

E. L. Shaner

EDITOR-IN-CHIEF



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| Sheets | Squares | Pipe | Welding Electrodes |
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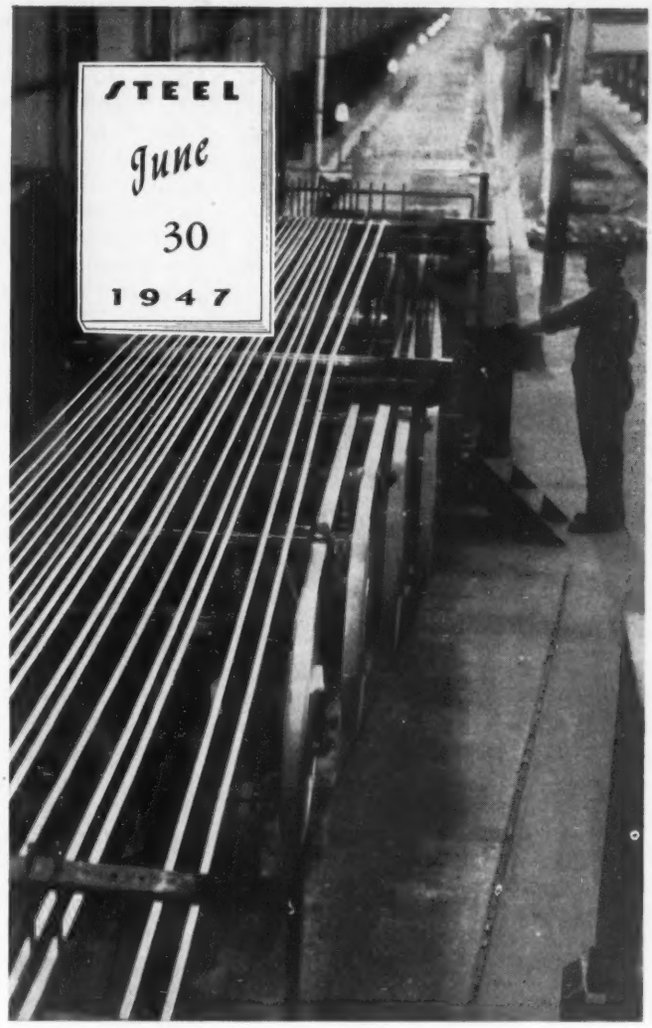
# RYERSON STEEL

# Galvanized Sheet Pinch Continues

*Output compares favorably with better prewar years, but is considerably less than current demand. Deliveries are slowest of any steel product. War conditions caused closing of some galvanizing lines*




*Four different widths of strip receive a zinc coating simultaneously in the electrogalvanizing department at American Steel & Wire Co.'s Worcester, Mass., works*

ALTHOUGH production of galvanized sheets currently is about on par with the better prewar years, this commodity is perhaps the tightest steel product in the market today and is expected by many to be the last of the flat-rolled steels in which supply will balance demand.

Nearly 80 per cent of galvanized sheet users have inventories of under 60 days' supply and less than 5 per cent can obtain deliveries within two months, a recent study of consumers' steel stocks and deliveries reveals (STEEL, June 16, p. 57). Deliveries actually have been becoming slower in recent months, in contrast to the improvement in practically all other steel products.

For some manufacturers, galvanized flat-rolled products have become the No. 1 chokepoint of production. A midwest maker of ventilators, for example, now reports he is able to obtain all the materials and components necessary, including electric motors, except galvanized sheet and strip.

Shipments of galvanized sheet for the first four months this year amounted to 525,470 net tons, indicating production at an annual rate of about 1,600,000. Best recent production year was 1940 when 1,695,300 tons were produced.

While output is nearly up to that of prewar, demand for galvanized products has expanded tremendously to cause the present pinch, just as it has in other flat-rolled products.

In 1940, about 40 per cent of galvanized sheet production, or 680,000 tons, was used for roofing. During the war, little galvanized sheet was available for roofing and as a result the current demand for roofing sheets is far greater than 680,000 tons a year.

Normally, the farm market takes from 150,000 to 200,000 tons of galvanized sheets for stock tanks, grain bins, corn cribs, sheds and other miscellaneous items. These also were neglected during the war and the replacement demand is large. High prices for lumber are increasing the demand for galvanized sheets for farm construction work.

New homes require between 200 and 300 lb of galvanized for gutters, spouting, furnace pipe and ducts, and other uses. With new homes being started at a rate of 65,000 a month, annual requirements of 100,000 tons are indicated. Older homes require a considerable tonnage for repair and replacement.

Freight car construction is taking 6000 tons a month.

Roadbuilding and maintenance were held to a minimum during the war, and as a result the various states and other subdivisions accumulated a considerable backlog of highway construction and repair. This requires a large tonnage of galvanized products for culverts.

Home furnace manufacturers produced nearly 700,000 units last year and most of these require a considerable tonnage of galvanized tin.

Electrical machinery and equipment manufacturers, appliance and home equipment manufacturers are seeking tonnages much larger than prewar.

Added up, these requirements for galvanized products are simply greater than present output.

Members of the industry are not optimistic over prospects for users of galvanized sheets obtaining early relief. Although several steel companies are installing modern continuous galvanizing facilities, these additions are likely to be offset by the writing off of antiquated facilities.

As a matter of fact, galvanized sheets have been one of the less profitable products for many mills, even before the war. Industry spokesmen doubt that present galvanizing facilities are being operated at more than 60 per cent of capacity. In 1946, according to American Iron & Steel Institute capacity and production figures, output was only 48 per cent of capacity.

During the war, zinc was in short supply and many galvanized sheet producers shut down their lines. The skilled labor required was absorbed into other departments or found other types of employment.

When the war ended, zinc supply be-

came freer, but the price was higher. Galvanized sheets, with other steel products, remained under price control. As a result, there was no incentive for producers who had closed their galvanizing departments to resume production, after having broken up their galvanizing lines and then facing an unprofitable market.

As a result some plants have not resumed production of galvanized sheets and have no plans for doing so. Others have become captive plants, are producing only for subsidiaries or are operating on a restricted basis.

Jones & Laughlin Steel Corp., Pittsburgh, Eastern Stainless Steel Corp., (Eastern Rolling Mill Co.), Baltimore, Great Lakes Steel Corp., Detroit, Youngstown Sheet & Tube Co., Youngstown, and Parkersburg Iron & Steel Co., Parkersburg, W. Va., have discontinued production of galvanized sheets. Lackawanna plant of Bethlehem Steel Co. also is out of the galvanized field.

Andrews Steel Co., Newport, Ky., is no longer producing commercial quality galvanized sheets, restricting output to galvannealed and paint bond quality. Production emphasis is on silicon sheets, with result galvanized sheet output is less than 50 per cent of capacity.

Weirton Steel Co. is reported to be shipping nearly half its galvanized sheet output to Stran-Steel Division of Great Lakes Steel Co., and a substantial portion of remainder is distributed through company's warehouses in Texas. A new continuous hot-dip galvanizing line is scheduled to be in operation at Weirton late this year, and an additional electrolytic line is expected for 1948.

Granite City Steel Co. is reported producing only 16 gage and heavier, and 29 gage roofing sheets.

Output of galvanized sheets at Apollo Steel Co., Apollo, Pa., Niles Rolling Mill Co., Niles, O., Reeves Steel & Mfg. Co., Dover, O., has been restricted by limited sheet bar supply, although in all instances hot-rolled sheet output is getting the preference. Distribution of Apollo Steel Co.'s output is restricted to members of the syndicate who share in plant's output of finished steel under the new ownership. Niles Rolling Mill Co.'s galvanized sheet output this year will approximate 36,000 tons, in contrast to rated capacity of 51,600 tons.

Superior Sheet Steel Co., Canton, O., formerly a subsidiary of Continental Steel Corp., and now owned by Borg-Warner Corp., Chicago, is not selling galvanized sheets in the open market. Bulk of output at this plant is restricted to hot-rolled sheets, while inter-company operations absorb what little galvanized tonnage is produced.

Wheeling Steel Co. is considering modernizing equipment for galvanized sheet output with installation of a continuous hot-dip galvanizing line at Steubenville, O. Present output is well below capacity, but compares favorably with prewar volume. This company has a number of fabricating subsidiaries that use considerable tonnage of galvanized sheets annually. However, company officials state distribution pattern among customers and with its fabricating units has been on a prewar basis with no preference extended to subsidiary plants.

U. S. Steel Corp. has continuous hot-dip galvanizing lines on order for Carnegie-Illinois Steel Corp.'s Irvin, Pa., and Gary Works; also for Tennessee Coal, Iron & Railroad Co. In near future galvanizing sheet operations at Carnegie's Vandergrift plant will be switched to the Irvin Works. Carnegie-Illinois has galvanized sheet capacity of 367,400 tons; Columbia Steel has 122,270 tons; TCI has 203,000 tons. Output by U. S. Steel plants currently is well below capacity, although shipments compare favorably with prewar.

A number of factors are restricting production of galvanized flat-rolled products. One of the most important of these is the fact that producers are emphasizing the production of hot and cold-rolled sheets and tin plate products which return a greater profit. Galvanizing departments of most mills are not being allocated all the sheet steel they could use.

Another factor limiting galvanized sheet output is the preference of nearly 70 per cent of the consumers for tight or extra tight coatings. To accomplish this, producers have to curtail coating speeds, which places the product in a more unfavorable profit position.

Freight absorption is another factor. Mills are unwilling to ship galvanized sheets long distances as long as they are able to dispose of all their production within a short radius of their mills.

The net result is that effective galvanizing capacity has been reduced to about 2,625,000 net tons, compared with 2,850,000 tons at the beginning of 1945 (see accompanying table). This capacity, operated at about 60 per cent of capacity, indicates production this year will be not quite 1,600,000 tons, or considerably less than demand.

Mills selling galvanized sheets generally are not able to fulfill the demands of their old customers and have been shipping on a quota basis figured on prewar consumption. Customers of companies which have discontinued production or new companies which never have had a position on mill books often are out of luck. Some old customers located at points remote from the supplying mills also are having difficulty in obtaining supplies.

Electrogalvanizing was just getting well underway when the war broke out, and has not yet been tested in a normal market. Electrogalvanized sheets are being used successfully on surfaces

## GALVANIZED SHEET OUTPUT

| Year | Galvanized Sheets |
|---|---|
| 1946 | 1,402,426 |
| 1945 | 1,676,181 |
| 1944 | 1,370,973 |
| 1943 | 801,747 |
| 1942 | 951,520 |
| 1941 | 1,626,929 |
| 1940 | 1,695,300 |
| 1939 | 1,614,809 |
| 1938 | 1.176,709 |
| 1937 | 1,546,044 |
| 1936 | 1,442,185 |
| 1935 | 1,151,743 |
| 1934 | 864,558 |
| 1933 | 787,032 |
| 1932 | 575,445 |
| 1931 | 853,507 |
| 1930 | 1,170,681 |

## GALVANIZED SHEET CAPACITY

(Net Tons)

| | Jan. 1 1947 | Jan. 1 1945 | Jan. 1 1938 |
|---|---|---|---|
| American Rolling Mill Co. | 324,000 | 324,000 | 156,000 |
| Andrews Steel Co. | 96,000 | 96,000 | 90,000 |
| Apollo Steel Co. | 24,000† | 24,000 | 58,000 |
| Bethlehem Steel Co. | 240,000‡ | 288,000 | 165,000 |
| Continental Steel Corp. | 128,000* | 201,000 | 195,000 |
| Granite City Steel Co. | 60,000 | 60,000 | 60,000 |
| Inland Steel Co. | 96,000 | 96,000 | 72,000 |
| Jones & Laughlin Steel Corp. | ..... | 24,000 | 24,000 |
| Weirton Steel Co. | 150,000 | 150,000 | 72,000 |
| Niles Rolling Mill Co. | 51,600 | 51,600 | 33,000 |
| Parkersburg Iron & Steel Co. | ..... | 25,000 | 27,700 |
| Reeves Steel & Mfg. Co. | 42,120 | 42,120 | 50,000 |
| Republic Steel Corp. | 330,000 | 330,000 | 232,500 |
| Carnegie-Illinois Steel Corp. | 367,400 | 459,500 | 381,600 |
| Columbia Steel Co. | 122,270 | 100,910 | 49,700 |
| Tennessee Coal, Iron & Railroad Co. | 203,000 | 187,000 | 154,500 |
| Wheeling Steel Corp. | 390,000 | 390,000 | 85,000 |
| Eastern Stainless Steel Corp. | ..... | ..... | 33,500 |
| Great Lakes Steel Corp. | ..... | ..... | 28,000 |
| Youngstown Sheet & Tube Co. | ..... | ..... | 70,000 |
| Total | 2,624,390 | 2,849,130 | 2,037,500 |

† Produce for syndicate members only
‡ Drop due to discontinuance of operations at Lackawanna plant
* Superior Sheet Steel capacity dropped

to be painted and have found applications for bill boards, kitchen cabinets, partitions, inside trim of railroad cars, shower stalls, fluorescent lighting fixtures and similar uses. The dearth of hot-dipped galvanized sheets has caused some consumers to switch to electro-coated sheets. However, the market for electrogalvanized products remains to be tested when demand and supply of regular galvanized sheets comes into balance, probably some time in 1949.

## Vacuum Cleaner Sales for January-May Are 1,501,854

Sales of standard-size household vacuum cleaners in the first five months of 1947 aggregated 1,501,854, a total which was not reached in 1946 until the end of September, according to the Vacuum Cleaner Manufacturers' Association, Cleveland. January-May sales this year were 117 per cent above 690,577, the total for the same period of last year.

May sales totaled 318,094 cleaners, compared with the all-time high of 330,426 reported for April, and were 118 per cent greater than the sales in May, 1946, which amounted to 145,935 units.

## Adequate Can Output and Big Demand Seen in 1948

Bright outlook in 1948 for can manufacturers was pictured at the recent meeting in New York of the National Association of Purchasing Agents by W. C. Stolk, vice president, American Can Co., New York. Adequate supplies of tin plate as a result of increased mill capacity plus a higher level of demand for metal containers are seen for next year, and for this year, he said, actual requirements of metal container users are in approximate balance with anticipated 1947 plate receipts.

"There should be no scarcity of steel next year," Mr. Stolk asserted. "New mills for the production of tin plate now being installed will increase the production of tin and black plate by 25 to 33-1/3 per cent. I hope, and believe, the increased demand for metal containers will enable the can industry to utilize this increase in plate production," Mr. Stolk added.

Explaining the contract used by the industry whereby the supplier commits to fill all requirements of the buyer, Mr. Stolk praised the method as being "the best safeguard against the extreme of either a sellers' or a buyers' market." Return to a buyers' market, he warned the purchasing men, brings its disadvantages, too, although both seller and buyer fare better when wholesome competition for the customer's dollar exists.

# Committee Seeks Methods of Assuring Full Employment, Economic Stabilization

VIEWS on how to assure full employment and general economic stabilization are being unfolded in hearings launched in Washington last week by the congressional Joint Committee on the Economic Report.

Among the first of the industrialists to appear before the committee were Charles E. Wilson, president of General Motors Corp., and Paul G. Hoffman, president of Studebaker Corp. and chairman of the Committee for Economic Development.

Emphasizing the importance of the automobile industry to the nation's economy, Mr. Wilson asserted that industry alone can practically underwrite a high level of industrial activity for several years "unless we have another wave of crippling strikes or a world catastrophe."

What the country needs most, Mr. Wilson declared, is continuous, uninterrupted, efficient production, and to this end the nation must be protected from "organized unemployment—that is, monopolistic strikes that paralyze whole vital industries or shut down one important community after another."

In appearing before the congressional committee, Mr. Hoffman suggested three key methods of fighting deflation, if it occurs in the near future. They are: 1. Immediate tax reduction; 2. easing or ending any remaining restrictive controls on production, trade or credit; and 3. accelerated stockpiling of strategic war materials.

In addition, Mr. Hoffman said business should take advantage of a recession by "moving rapidly on planned capital expansion," intensifying sales and advertising effort, and introducing new products.

# Present, Past and Pending

### ■ PENNSYLVANIA RAILROAD ORDERS 1000 CARS

PHILADELPHIA—Pennsylvania Railroad has given its Altoona, Pa., works an order for 1000 steel box cars to cost $4,580,000. This makes a total of 2100 box cars the railroad has ordered during the last 10 months at a total cost of $9,850,000.

### ■ EXPORTS EXPECTED TO START DECLINING

WASHINGTON—Shipments of American goods to overseas markets have reached their peak and will start dropping, says the U. S. Commerce Department, explaining that foreign countries have been using up their dollar exchange so fast that by the end of this year dollars abroad probably will grow scarce.

### ■ GOVERNMENT-OWNED SURPLUS STEEL OFFERED

CHICAGO—War Assets Administration is offering 1,300,000 lbs. of hot and cold-rolled steel to priority claimants at fixed prices through WAA catalog CG-91-1194, Bruce J. Brown, regional director, announced. Included are 800,000 lbs. of hot-rolled sheets, bars, plate and stainless strip, and 310,000 lbs. of cold-rolled sheet and strip.

### ■ STUDEBAKER CORP. IS SOLE BIDDER FOR PLANT

CHICAGO—Studebaker Corp. was the sole bidder last week for the government surplus airplane parts and engine plant at South Bend, Ind., operated by the corporation during the war. Studebaker's bid was $3,291,000.

### ■ $2½ MILLION EXPANSION PLANNED FOR BUFFALO

BUFFALO—American Radiator & Standard Sanitary Corp. has earmarked $2½ million for expansion of its plants here.

### ■ AMERICAN ROLLING MILL CO. BUYS BUILDING

ASHLAND, KY.—A mold yard building at the American Rolling Mill Co. plant here has been sold by the War Assets Administration to the company for $33,000. Also included in the sale is an ingot extractor.

### ■ MACHINE TOOL SHIPMENTS DECLINE SLIGHTLY

CLEVELAND—Estimated total shipments by the machine tool industry in May amounted to $25,791,000, declining approximately 4 per cent from April's total to the lowest point since September, according to the National Machine Tool Builders' Association.

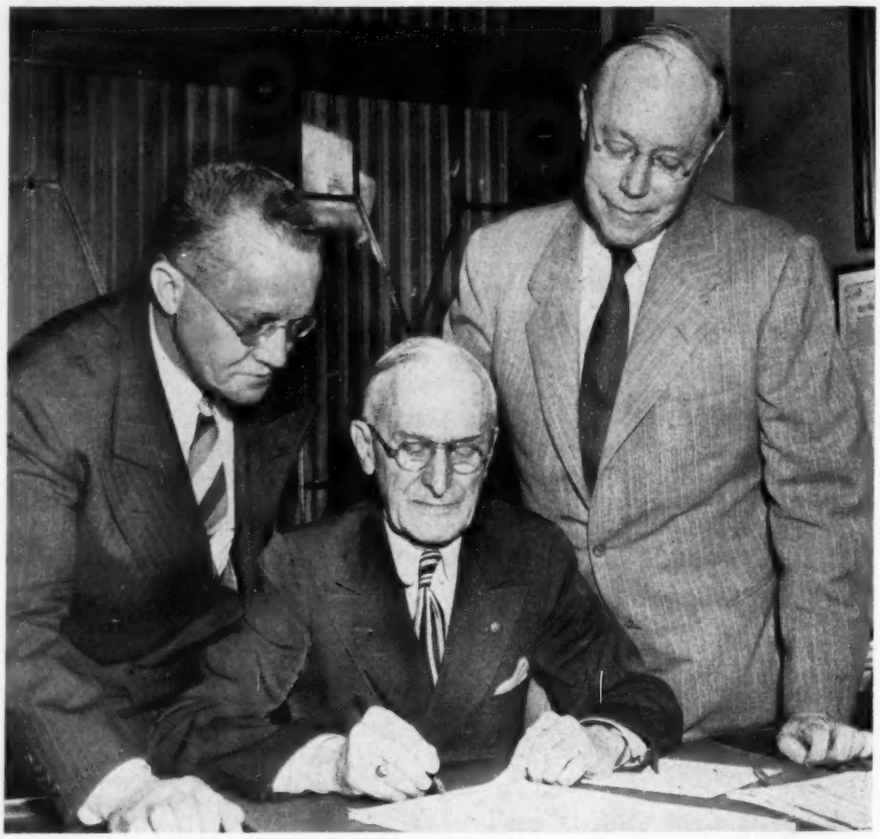
# New Era of Labor Relations at Hand

*Taft-Hartley revision of Wagner Act to curb union excesses, equalize relations between employees and management. Permits healthy activity by labor unions*

A NEW era of labor-management relations was ushered in June 23 when the Senate overrode a presidential veto to place the Taft-Hartley labor reform measure on the statute books.

Industrial management was elated by the congressional action which to a considerable extent puts balance in the national labor laws and curbs numerous union activities which have sprung up in the 12 years in which the Wagner Act has been in effect.

While the new law should go far in equalizing relations between employers and employees, few expect it will bring immediate industrial peace. In fact, for a time labor-management relations may be more turbulent than they have been in recent months. Union leaders have declared their intentions to contest the law in the courts. The complexities of the law's provisions indicate such a campaign of harassment may be fairly effective in preventing smooth functioning of the act.



*Labor reform measure becomes law as Senate overrides presidential veto. Pictured above are Senate Secretary Carl A. Loeffler, center, signing the bill, while Rep. Fred A. Hartley, left, and Sen. Robert A. Taft, sponsors of the measure, look on. NEA photo*

### Miners Conduct First Onslaught

The first notable onslaught against the law was conducted by members of the United Mine Workers-AFL who started leaving the coal mines soon after the measure was enacted. The miners were scheduled to start a 10-day vacation period on June 28, but several hundred thousand miners had quit work by midweek. Today the mines are scheduled to be returned to private owners by the government. No contract exists between the private operators and the miners, and whether the miners will return to work when the vacation period ends July 7 is questionable.

Another potential obstacle to the smooth functioning of the new law lies in the attitude of its administrators. Although the National Labor Relations Board has announced that it will give the act "the fairest and most efficient administration that lies within its powers," it is noted that the federal administration fought the legislation vigorously and some observers believe the federal administration, for political reasons, might find ways to thwart the intentions of the law's proponents.

In this connection, it is pointed out that the administration of the Wagner Act, by strongly pro-union National Labor Relations Boards, coupled with the fact that the whole environment of the New Deal was zealously pro-labor, resulted in interpretations and decisions that were almost invariably favorable to the labor unions.

However, the first reactions of the NLRB appeared to be to administer the law in conformity with the intent of its authors. Without waiting for the President to nominate the two extra members provided by the new law, the NLRB has started to formulate policy revisions in harmony with the purposes of the Taft-Hartley Act.

Long before that date, board spokesmen told STEEL, the NLRB will start issuing policy statements and interpretations for the guidance of management and labor, proposing to enter new contracts. These interpretations will be issued only on provisions of the new law that require clarification.

The law's provisions are not as harsh as claimed by the measure's opponents. It is not a "union busting" law. Given fair and efficient administration, the law should curb the excesses of union leaders but permit healthy union activity, according to close students of the act. These observers believe the unions would be wise to pay closer attention to the gains they have made in contracts negotiated over the past decade and which spell out labor's rights in considerable detail.

Certain provisions of the new law become effective at once. These include:

The government can obtain 80-day injunctions against strikes endangering the national health and safety. Presumably the government can seek an injunction against the United Mine Workers if they refuse to return to work at the end of the vacation period a week hence.

Union welfare funds can be established only for purposes specified in the law and only if employers participate in their administration. New contracts can provide for checkoff of union dues only with the voluntary consent of the individual workers.

Unions are prohibited from spending money or making contributions in connection with political campaigns for federal offices.

Damage suits may be filed against

unions for breach of contract, jurisdictional strikes and secondary boycotts.

Other provisions become effective in 60 days after enactment or on Aug. 22. These include:

Closed shop provisions are barred in new contracts.

Union shop provisions are allowed in new contracts only if favored by a majority of the employees in an election conducted by the NLRB. Closed and union shop provisions affect some 7 million employees, and unions will be prohibited from dismissing members for any reason other than non-payment of dues.

Neither unions nor employees are permitted to terminate a contract without a 60-day notice and strikes or lockouts are prohibited until after the 60-day period expires.

. Foremen are excluded from the guaranteed collective bargaining provisions of the Wagner Act, although they may form associations if they desire.

**Unions Must Report on Finances**

Unions are required to file detailed reports on finances and internal affairs with the Department of Labor. Officials in unions seeking NLRB recognition must file affidavits disclaiming membership in the Communist party or groups favoring overthrow of the government by force.

Both employers and employees are given greater latitude in asking for NLRB elections to determine whether a union should be recognized or not.

Jurisdictional strikes and secondary boycotts are forbidden and can be enjoined by the NLRB.

Unions become subject to charges of unfair labor practices. The old sections of the Wagner Act prohibiting employers from discriminating against employees because of union activity are retained and six unfair labor practices by labor organizations are defined. These are: 1. Restraining or coercing employees or employers, intended to stop unionization by force and to stop unions from coercing employers in the selection of representatives for collective bargaining or for adjustment of grievances; 2. Persuading or attempting to persuade employers to discriminate against an employee, unless in accordance with the law; 3. Refusing to bargain collectively, to stop unions from serving ultimata on employers; 4. Conducting jurisdictional disputes and secondary boycotts and strikes against NLRB certification; 5. Requiring initiation fees which the NLRB finds "excessive or discriminatory;" 6. Causing or attempting to cause an employer to pay money for services which "are not performed or are not to be performed," to combat "featherbedding."

The act provides for revamping of the structure of the NLRB. The board's membership is to be increased from three to five and members' salaries raised from $10,000 to $12,000 annually. The law abolishes the review section, comprising about 300 lawyers, which under the former setup "predigested" all records for NLRB members and which has been accused of unduly influencing the action of the board. The task of reviewing each case now will be vested in the board members.

The law provides for a general counsel of the board, to be appointed by the President subject to Senate confirmation. The general counsel's salary will be $12,000 and his duties will include supervision over all lawyers employed by the board, except trial examiners and legal assistants to board members, and over all employees in regional offices.

A new Federal Mediation and Conciliation Service is created by the law. This service has been divorced from the Department of Labor, due largely to the insistence of industry spokesmen that the old conciliation service was partial to labor.

The director of the new mediation and conciliation service will be paid $12,000 annually, placing the service on the same plane as the NLRB. The new office will offer its services in disputes affecting interstate commerce or will intervene in other disputes on request.

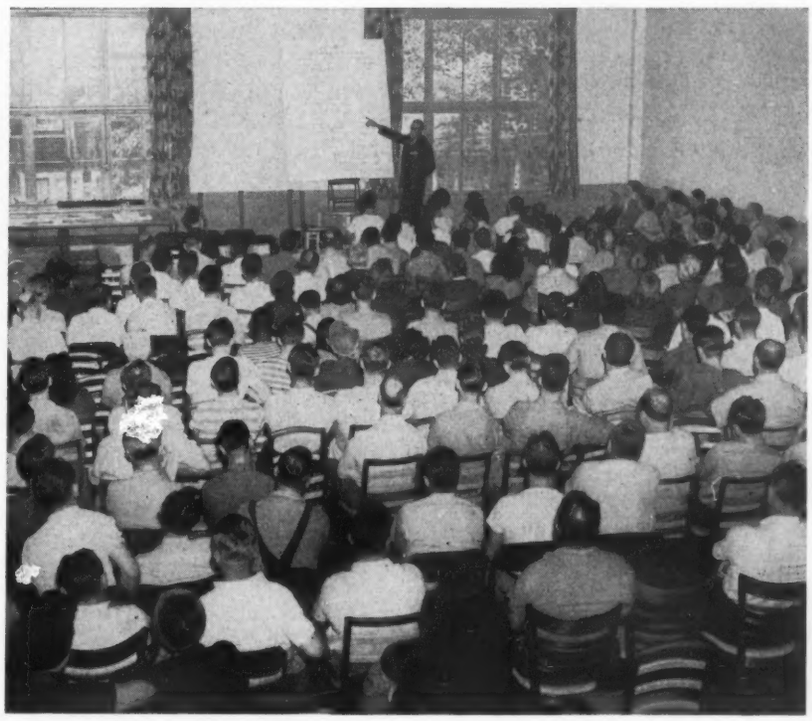
The section creating the mediation service parallels a similar provision in the Railway Labor Act and provides that either party shall give 60-day notice of proposed termination of contract.

Within 30 days of the expiration of the contract, the mediation service is to be notified and then the parties would have to maintain the status quo for 60 days. This would exclude employees from striking or employers from locking them out. In event of a strike during this period employees would lose their rights under the act. An employer violating the provisions would be subject to a cease and desist order from the board.

A labor-management panel, which now advises the present chief of the conciliation service is made statutory. Its 12 members are divided equally between labor and management.

Another section provides for a joint congressional committee assisted by an advisory body of labor and management to study the field of labor relations. The committee will have extensive powers of inquiry and can subpoena witnesses and employ experts to assist them.

Sen. Joseph Ball (Rep., Minn.) has been mentioned as probable chairman of the congressional committee, and as such may be the "watchdog" for Congress to see the law is administered as intended.



**JOBHOLDERS MEETINGS:** Pitney-Bowes Inc., maker of mailing machines, recently inaugurated "annual jobholders meetings" for the 1400 employees at its factory in Stamford, Conn. Meetings were held on company time during the week of the annual stockholders meeting. Photo shows company president, Walter H. Wheeler Jr., explaining profits to one of six groups to whom he reported the year's financial operations, present problems and future plans

# Adequacy of Steel Capacity Explored

***Inland president tells Senate Small Business subcommittee steel supply will satisfy country's needs by end of 1947***

SENATE investigations into the "gray" market in steel have developed into a probe to determine whether the nation's steel production capacity is adequate to meet future needs and to sustain maximum employment.

That is a logical development, for a "gray" market is the outgrowth of an insufficiency of supply compared with demand. So in studying a shortage it was inevitable that the supply should undergo scrutiny, and in this instance not only the immediate supply is being looked into but also the long-range supply prospects.

While some spokesmen aver the supply-demand situation in steel will be pretty well balanced by the end of 1947, others testify in hearings that they see an increasing consumption of steel that would make steel production capacity inadequate.

Hearings on the steel prices and supply situation were recessed last week by the Steel Subcommittee of the Special Senate Committee To Study Problems of American Small Business so that staff members could be in the field to check on various matters developed in recent testimony.

*Louis H. Bean, left, U. S. Department of Agriculture economist, in appearing before the Senate small business subcommittee investigating the steel price and supply situation declared an estimate in the testimony of Wilfred Sykes, center, president of Inland Steel Co., regarding future demand for steel is too low. With them is Sen. Edward Martin (Rep., Pa.), subcommittee chairman.*
*Acme photo*

### Holds Abnormal Conditions Exist

Testifying recently before the subcommittee, Wilfred Sykes, president, Inland Steel Co., Chicago, said that present conditions in demand and supply are "abnormal because consuming elements and the industry are trying to build up pipelines and inventories predicated to a large extent upon anticipated future needs and a general boom psychology."

Commenting on the effects of a boom psychology that has led some steel users to pile up greater stocks than they actually need, Mr. Sykes cited the case of a small manufacturer who in prewar years used from 10,000 to 12,000 tons of steel a year and who is now carrying an inventory of 11,000 tons. The manufacturer, who was not identified, "had the idea that he was going to continue at his wartime rate" of using from 30,000 to 40,000 tons a year, Mr. Sykes told the investigators.

"I am satisfied that in general, by the end of this year, ample steel will be available to satisfy the needs of the country," Mr. Sykes declared.

Pointing out that the demand for steel does not follow averages, but is subject to peaks and valleys, he said that based on past experience since World War I, covering 1929, and down to World War II, "we arrive at an average ingot consumption of about 54 million tons for the next few years. Even in 1929," he said," there were periods when people could not get all the steel they wanted immediately, and "that condition will always exist."

On the basis of various assumptions, he told the investigators, we could anticipate a peak consumption of around 76 million tons of ingots under normal business conditions, compared with the steel industry's nominal capacity of around 90 million tons. The true capacity, however, as represented by economically operated plants is nearer 80 million tons, he pointed out, but "it appears we have ample capacity to take care of the requirements without any new building of plants."

Touching on the shortage of steel sheets, Mr. Sykes said: "Due to changing conditions which bring about demands for some particular products, we are plagued at the present time with a shortage of sheets. We are producing today more sheets than ever in history, but for many reasons the sheet requirements are in excess of immediate capacity." He added that large sums of money are being spent to build more sheet finishing capacity, but due to delays in delivery of equipment these installations will not be available for some time.

Mr. Sykes asserted that the 1946 steel strike and coal and transportation strikes resulted in a loss of between 12 million and 14 million tons of ingots. "This steel would have gone a long way towards satisfying the demands," he declared.

Taking issue with Mr. Sykes' estimates on future demand for steel was Louis H. Bean, Department of Agriculture economist. In terming Mr. Sykes' estimate as pessimistic, Mr. Bean told the committee he thought the demand in 1950 would be about 100 million tons.

An error in estimates, Mr. Bean declared, "can be costly to industry, to farmers, to the country as a whole, and to world recovery, for it leads to a slower rate of capacity expansion not only in steel but in other key industries directly and indirectly dependent on steel."

Mr. Bean testified further that Mr. Sykes' estimate of a need for 76 million tons of steel a year "is in effect about in line with the production of 1939 when 16 per cent of the labor force was unemployed and on relief." If Mr. Sykes' estimate materializes, Mr. Bean declared, "it could mean 10 million to 12 million persons unemployed in the early 1950s."

Another one of the higher estimates

from government economists was the statement of Ewan Clague, Commissioner of Labor Statistics of the U. S. Department of Labor. His testimony was largely a condensation of a department report which attempts to project industry factors into 1950.

His calculations point to a demand of from 98 million tons of ingot steel to around 120 million tons, with the " 'realistic' situation lying somewhere between them."

Explaining the basis for his calculations, Mr. Clague said the estimates of high demand for steel should not be particularly surprising. "The estimates refer to a situation with roughly 12 million more people at work than before the war, and with no reduction in the level of average working hours. In addition, it has been assumed that these people will be working at a higher level of output per hour of work. It is to be expected, then," said Mr. Clague, "that more materials will have to pass through their hands during each hour if they are to be fully occupied. More materials needed per hour and a greater total of hours worked should then require a substantially greater total of materials, including such a basic material as steel."

**Greater Supply Required**

Tom J. Smith Jr., president of Pressed Metal Institute, Cleveland, summed up what the smaller users of steel have been telling the investigators, when he said he was "interested in seeing that we have a lot more steel than we have today."

Mr. Smith's testimony was in some respects an explanation why the steel supply is insufficient to meet demand. He pointed out that in the past eight years the number of establishments using iron and steel has grown from 20,400 to 33,600, an increase of 64.7 per cent.

Mr. Smith charged that part of the difficulty small stampers are having in procuring steel stems from refusal of steel producers to serve users of small tonnages. He declared that in addition, the steel producers, as well as aluminum, copper and brass interests, "are making consumer durables and making stampings in competition with our own members." Explaining that materials demands of some large users are recognized when those of the smaller stamper are ignored, Mr. Smith charged "it is dangerously close to discrimination. It is a thing that this committee, I assume, is trying to find out about, where the little fellows are going."

Prior to his appearance as a witness, Mr. Smith filed with the committee a brief in which he asked restoration of the "Pittsburgh Plus" pricing system as a means of facilitating procurement of steel by consumers. Part of the difficulty stamping shops are having in obtaining steel is attributed to abolition of "Pittsburgh Plus," and, Mr. Smith said, thinking men in the stamping industry believe restoration of "Pittsburgh Plus" would be far preferable to the best interests of both makers and purchasers of steel than the current procedure (multiple basing point system), or the "more hazardous f.o.b. mill procedure."

## Shippers Seek To Prevent Boost in LCL Rail Rates

Further requests are being filed with the Interstate Commerce Commission asking that body to deny the petition of railroads in Official Classification Territory for an increase in rates on all less than carload shipments in first, second, third and fourth classes.

That increase, proposed for July 20, would be on a mileage basis and would range from 10 per cent on long hauls to 110 per cent on short distances.

Recently the commission declined to authorize a proposed increase of 25 per cent in lcl rail rates on the exceptions list of manufactured iron and steel products in Official Classification Territory. That increase had been scheduled to become effective June 20. The commission's action postpones effective date of the increase to Jan. 19, 1948, subject to any decisions reached in the intervening period.

On the basis of complaints from shippers that increased rates on the exceptions list of manufactured iron and steel products would disturb the balance of competition, the commission decided a thorough investigation is in order to determine what the proposed increases would mean to the economy. Hearings are to be held, starting at a time to be announced soon.

## Shipment Value of Porcelain Enameled Products Up 55%

Dollar value of total shipments of porcelain enameled products for the first four months of 1947 was 155 per cent of the total for the same period in 1946, and 256 per cent of the four-month total for 1945, according to a report released by the Porcelain Enamel Institute, Washington, D. C.

Shipment values reported for porcelain enameled refrigerator parts in the first four months of 1947 were twice as great as the values during the same 1946 period, and 14 times as great as in 1945. Washing machine parts values, compared on the same basis, were two and a half times as great in 1947 as in 1946; values for store fronts and other architectural porcelain enamel parts were twice as great in 1947 as in 1946.

# Munitions Board Appoints 21 to Steel Committee

*Industry leaders named to advisory group which includes representatives of scrap, iron ore, coke and foundry trades*

ORGANIZATION by the Army & Navy Munitions Board's Iron and Steel Industry Advisory Committee has been virtually completed with 21 members. At present the committee is made up so as to include representatives of the basic iron and steel industry and of subsidiary industries such as scrap, iron ore and coke. The committee also includes two foundrymen, one representing the gray iron and the other the steel casting industry.

Munitions board spokesmen say that they prefer to work with rather small committees, and do not want to make them so large as to prove unwieldly. However, they are prepared to call on additional industry men if necessary.

Membership of the Iron and Steel Industry Advisory Committee is as follows:

George W. Cannon, president, Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich.; Joel Claster, Luria Bros. & Co. Inc., Philadelphia; H. G. Batcheller, president, Allegheny Ludlum Steel Corp., Pittsburgh; B. F. Fairless, president, U. S. Steel Corp., New York; John E. Galvin, president, Ohio Steel Foundry, Lima, O.; Arthur B. Homer, president, Bethlehem Steel Corp., Bethlehem, Pa.

Charles R. Hook, president, the American Rolling Mill Co., Middletown, O.; Walter R. Howell, president, Bliss & Laughlin Inc., Harvey, Ill.; Elton Hoyt II, Pickands Mather & Co., Cleveland; Henry J. Kaiser, Henry J. Kaiser Co. Inc., Oakland, Calif.

Admiral Ben Moreell, president, Jones & Laughlin Steel Corp., Pittsburgh; Hugh Morrow, president, Sloss-Sheffield Steel & Iron Co., Birmingham; Hayward Niedringhaus, president, Granite City Steel Co., Granite City, Ill.

Frank Purnell, president, Youngstown Sheet & Tube Co., Youngstown; Henry A. Roemer, chairman, Sharon Steel Corp., Sharon, Pa.; Wilfred Sykes, president, Inland Steel Co., Chicago.

Gen. Brehon Somervell, president, Koppers Co. Inc., Pittsburgh; Walter S. Tower, American Iron & Steel Institute, New York; Ernest T. Weir, chairman, National Steel Corp., Pittsburgh; C. M. White, president, Republic Steel Corp., Cleveland; Robert W. Wolcott, president, Lukens Steel Co., Coatesville, Pa.

# Steel Industry Development Called Britain's Biggest Peacetime Project

***Total ingot capacity will be boosted from present 14 million tons to 20 million tons annually. Program, expected to require 7½ years for completion and estimated to cost $800 million, calls for expenditure of $60 million for American equipment***

REVIEWING progress of the new steel development plan in Great Britain since it was announced in May, 1946, Robert Shone, secretary of the Iron & Steel Federation, terms it the biggest industrial project ever undertaken in peacetime Britain.

In a paper read to the Royal Statistical Society, Mr. Shone pointed out that more than £200 million ($800 million) will be spent during the next few years to increase the annual effective capacity of the steel industry to 16 million ingot tons. Old plant with a 4 million ton capacity will be kept to meet peak demands, making a total capacity of 20 million tons a year. As the present annual capacity of the British steel industry is around 13 or 14 million tons, the importance of the expansion program both to the home and export trade can readily be seen.

Detailed plans covering about two-thirds of the capacity to be built under the program have been submitted by the British Iron & Steel Federation, the organization representing the industry, to the government's Iron & Steel Board. Most of these plans have been approved by the board and work on them has started.

The plan entails expenditures of some $60 million on American equipment, which represents 7½ per cent of the total expenditure involved. If all this American equipment is obtained, it is expected the whole project will be completed in 7½ years.

While full benefits of the program will not be reaped for several years, some of the new plant will be coming into operation this year. If at the same time the improving trend of coal output can be maintained, the outlook for British industrial production and exports in 1948 should be markedly more hopeful than seemed possible earlier.

Biggest increase in steel ingot capacity is planned for Northamptonshire, with substantial increases also in prospect for Lincolnshire and South Wales. It is in South Wales that the largest amount of new steel ingot capacity is to be built, but most of it is to replace the older plant now in use. In only one district, the Northwest Coast, is no new steel ingot plant to be built; some of the existing plant there will eventually be scrapped. In Staffordshire too, although new plant will be built, total capacity when the plan is finished will be lower than today.

Overall result of the new plans will be that, while the wide geographical distribution of Britain's steelmaking industry will not be fundamentally changed, the enlarged production capacity planned for the next decade will be concentrated more in the areas which already have the major shares of the industry's present capacity, namely South Wales and the Northeast Coast, and in the newer, rapidly expanding plants of Northamptonshire and Lincolnshire. The smaller centers will decline somewhat.

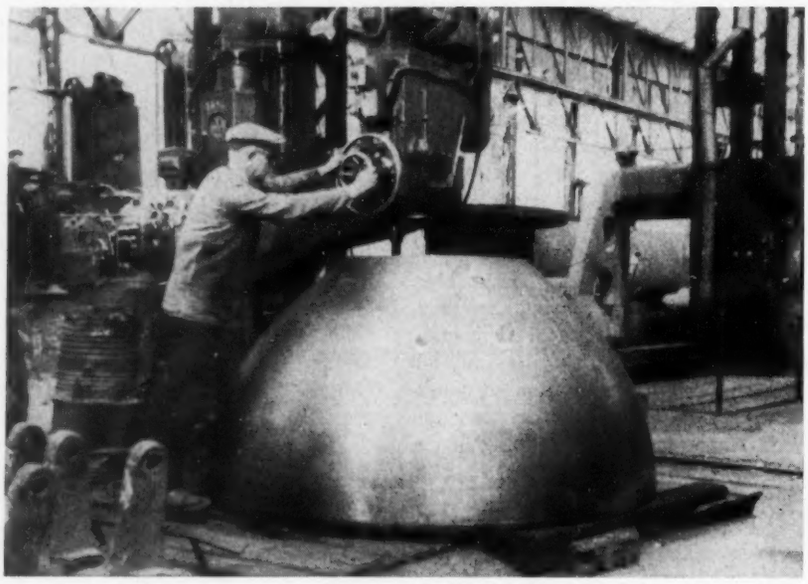
Home demand in the period 1950-1955 is expected to reach 13 million ingot tons, and export demand 3 million. These estimates may be compared with actual home deliveries in 1946 of 11.1 million tons and export sales of 2¼ million. They are based on the long-term upward trend of demand for steel throughout the world.

Export demand is also expected to grow despite the fact many of Britain's best customers have made additions to their own productive capacity greater than the amount they imported from Britain before the war. Too, demand for steel in these countries probably will remain above their home industry's capacity for a considerable number of years. Also, it is felt the long-term upward trend of world demand and the probability that Germany's level of output will continue to be restricted for an indefinite period will more than offset the growth of steel capacity in recent years both in the United States and elsewhere.

# Increased Activity of Engineering Industry In Italy Stimulates Demand for Materials

INCREASED activity of the Italian engineering industry during the past few months with orders from Argentina and from several Latin American countries for cranes and railway rolling stock has resulted in expanded demand for iron and steel and other materials.

The Trieste shipbuilding industry (Monfalcone) has ordered 20,000 tons of plating from Alpinen Montan Gesellschaft in Vienna to be paid with gold currency (dollars), while the engineering industry should import from 20,000 to 30,000 tons of plating from Belgium



**TESTS "BATHYSCAPHE": Top half of Prof. Auguste Piccard's "bathyscaphe" is put through radium x-ray test to detect any possible impurities in the steel. Construction of the unique steel sphere is underway at the S. S. Henricot Steel Works in Belgium. It will be completed about July 1. NEA photo**

on the basis of the new Italo-Belgian trade agreement which has settled the monetary exchange difficulties that have been experienced in Italian purchases of steel from Belgium. In progress are negotiations to obtain 10,000 tons of steel from Czechoslovakia against Italian fresh fruits and vegetables.

It has been confirmed that the Apuanic steel plating works is to be sold to Argentina, proceeds of the sale to be used in purchasing scrap iron on several overseas markets. An Italian mission was to leave this month for the Union of South Africa to investigate the possibility of co-operation between the Italian steel industry and the South African mining industry. An offer has been received also from Turkey in this connection. Because of difficulties Turkey has experienced in selling chrome ore it has been suggested such ore be imported into Italy on account of Turkish capital to be invested in the Italian metal industry to turn out materials for machinery for Turkey's industrialization program.

## Strikes Mar Progress in French Industrial Activity

*PARIS*

Before the present wave of strikes engulfed France, industrial production was rising.

Automobile output in March had reached 90 per cent of the average production in 1938, compared with 78 per cent in February. Produced in March were 6137 private automobiles, of which 5840 were exported. Of 6840 commercial vehicles manufactured in March, 3220 were exported.

Also iron and steel output had been rising, the April figures being the highest attained since the liberation. Production of steel ingots and castings in April reached 508,000 metric tons, making a total of 1,941,000 tons for the first four months of 1947, compared with 1,119,000 tons in the corresponding period of last year. Pig iron and ferroalloy output in April was 416,000 metric tons, totaling 1,586,000 tons for the first four months of 1947, against only 817,000 tons in the first four months of 1946.

Coal production, however, had shown a slight downward trend recently, but imports have been at a higher level than in the earlier months of 1947.

The strike wave spread over the country after the Communists left the government early in May, having refused to support the program of franc stabilization by freezing wages and imposing price reductions.

Premier Paul Ramadier has accused the French Communist party of inspiring the strikes in the most strategic industries, in an effort to topple the present Republican regime.

# Construction of Cold Reduction Mill on West Coast Progressing

***Columbia Steel's new sheet and tin plate facility nearly half finished with prospects of operation early next year. Steel famine on Coast seen continuing until the $25 million plant begins production***

*SAN FRANCISCO*

COLUMBIA Steel Co.'s $25 million cold rolled sheet and tin plate mill being erected at Pittsburg, Calif., is nearly half completed.

This plant, one of the most modern of its kind in the country, will be of outstanding importance to West Coast industry. Not only will it provide large tonnages of tin plate, of which the West Coast consumes 40 per cent of the nation's supply, but it will relieve the serious shortage of steel sheets which has been plaguing western steel fabricators for many months.

Indications now are that the sheet shortage will become more acute before it gets better. It appears unlikely the shortage will be alleviated until the new Columbia mill is placed in operation.

Date of completion of the plant still remains uncertain and will depend largely on deliveries of certain types of equipment, still scarce and partially unobtainable. Indications are, however, that the mill will begin rolling early next year.

More than 4000 tons of structural steel have been erected thus far in the buildings which will house part of the new mill.

### Part of Facility Completed

Other components of the plant have been completed. For example, a new fireproof wharf has been finished in the deep water channel adjacent to the plant to berth ocean-going vessels. A large barge pier has been constructed nearby.

Up to now approximately 600 carloads of machinery and equipment already have been received at the plant site, with additional shipments being received daily. Included in these shipments are several new 65-ton and 85-ton diesel locomotives to handle increased traffic within the plant in connection with the cold reduction processes. Five miles of new railroad trackage have been laid.

Over 80 per cent of the machinery and equipment required for the new plant has now been delivered. The principal bottleneck has been in shipments of electric motor equipment.

Columbia already has installed 16 overhead cranes in the unfinished plant, ranging from 10 to 60 tons. These are in addition to the 10 cranes now in use in the old hot-rolled mill.

Construction of the new mill requires a considerable amount of underground work, as control and auxiliary equipment of the various process lines and mill units will be located in air-conditioned basements beneath the machinery served. Excavation work is proceeding rapidly on these underground rooms and on foundations for heavy machinery. More than 500,000 cubic yards of earth and rock have been moved to date.

Preliminary foundation work is also well under way, and some 23,000 cubic yards of concrete have been poured for permanent structures of the new mill.

Nearing completion east of the plant are a new administration building, an industrial relations building and a modern hospital. These buildings are expected to be completed late in July. They will be the future headquarters of the Pittsburg plant.

The new cold reduction mill located in the center of Columbia's present 400-acre plant, will produce the first cold rolled steel sheets and tin plate to be manufactured on the West Coast. About 700 men are employed on construction of the plant and related facilities.

## Colorado River Spanned by 1200-Mile Gas Pipeline

The 1200-mile pipeline which will carry gas from the Texas Panhandle to Los Angeles has spanned the Colorado river near Blythe, Calif.

Made by Consolidated Steel Co., Los Angeles, 60-foot sections of the 30-inch pipe were suspended in steel cables slung between two 116-foot towers 1020 feet apart on each bank of the river. The entire line is expected to be in service by next October.

## Report $1 Million Steel Mill To Be Built in West Mexico

A steel mill will be established in the state of Sinaloa in western Mexico, the Mexican news agency, Lania, reports. To be built near the site of iron ore beds, the project will be financed with $1 million in United States and Mexican capital.

# Windows of Washington

By E. C. KREUTZBERG — *Washington Editor, STEEL*

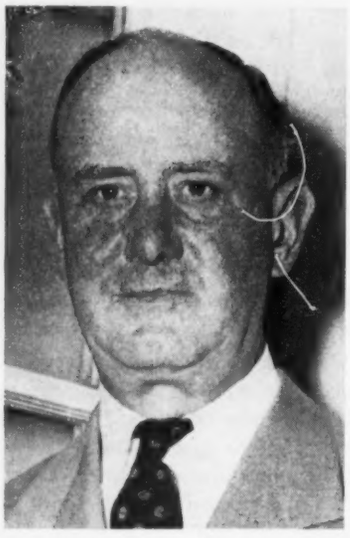
*Underneath hubbub accompanying major legislation is a continual hammering in 80th Congress to overhaul crazy-quilt pattern of governmental departments and agencies and cut their expenses. House action to date makes saving of $4.5 billion*

OBSCURED by the barrage of publicity surrounding the income tax reduction and labor law reform measures, and by the headlines that feature each new development in the rapidly worsening international situation is a process of continual hammering in the 80th Congress to overhaul the whole crazy-quilt pattern of governmental departments and agencies to bring them under closer control, to relate their activities more intimately with real public needs, and to cut their expenses.

**In announcing that House action to date on the appropriations front comes to a total saving of about $4.5 billion on the basis of President Truman's estimate of $37.5 billion, Chairman John Taber (Rep., N. Y.) of the House Appropriations Committee classed this as "merely a progress report. Confronting us are hundreds of money-spending boards, bureaus and commissions—the spawn of 14 years of misrule; much remains to be done. Every government agency is under study by appropriate committees of Congress. I am confident that we will be able to report much more progress in cutting unnecessary cost of government during the next session of Congress."**

### Reports Good Progress

In response to criticism from democratic minority spokesmen, Mr. Taber has announced a "bullet-proof record of the gratifying progress made since Jan. 3." The following figures totaling $3,701,326,029, official for the House Appropriations Committee, show the House cuts from President Truman's budget estimates of appropriations, repeals of appropriations and recoveries of funds into the Treasury, for the fiscal year ending June 30, 1948: Treasury-Post Office, $897,072,750; Labor-Federal Security, $78,825,520; Interior Department, $134,006,907; State, Justice and Commerce, $159,645,031; War Department-Military Affairs, $435,809,007; Navy Department, $377,519,200; Department of Agriculture (includes repeal of $108,000,000 for 1948 of Section 32 funds), $340,969,342; government corporations, $28,887,470; independent offices—direct cuts, $330,540,732; independent offices—additional cuts in proposed expenditures (U. S. Maritime Commission), $120,900,000; revised estimate submitted by the Budget, resulting from investigation by the Appropriations Committee (Veterans Administration—printing and binding, $1,500,000, pensions and compensation, $269,825,000), (War Assets Administration $20,750,000), aggregating $292,075,000; additional revenue to be recovered into the Treasury from sale and charter of vessels above amount included in Budget estimates of receipts, $505,075,000.



CHAIRMAN: Thomas J. Hargrave, president of Eastman Kodak Co., has been named executive chairman of the Army and Navy Munitions Board by President Truman. He replaces Richard R. Dupree, resigned

In addition, Mr. Taber points out the House has effected savings of $282,590,767 in the deficiency and other appropriations for fiscal 1947.

The Senate still has to act on a number of the above bills and is expected to vote for some increases. The Senate increased the House Interior Department appropriation bill by $54 million to allow for reclamation programs in the western states. On the other hand, the Senate is giving signs of going below the House figures in some instances. In general, therefore, until more exact information becomes available, Mr. Taber's recapitulation—made after House formulation of all the major appropriation bills—can be regarded as approximately accurate as of now. Appropriations still to be acted on by the House committee are relatively small.

## Rail Car Distribution Bill Hit

H. R. 3140, the Lemke bill which would take car distribution away from the railroads and place it in the hands of the Interstate Commerce Commission, is encountering strong opposition from the railroads in current hearings before the House Interstate and Foreign Commerce Committee.

"If this is done," declared J. M. Symes, Pennsylvania Railroad vice president, "it is the beginning of the end of private operation of the railroads."

**The way to get over the present car shortage is to provide quickly the needed materials for new cars and for repair of existing cars, he said; the car shortage cannot be solved by any legislation.**

**During the past 20 months, said Warren C. Kendall, Association of American Railroads, the number of new cars built for United States railroads has averaged barely more than 3000 per month, "or less than the number of cars worn out in war service which have had to be retired. We have assurances now that materials will shortly be available for building as many as 10,000 new cars per month. Orders from the railroads for 100,000 new cars are now on the books and approximately 25,000 additional cars are programmed for future order."**

"This is a time of general shortages," W. T. Faricy, AAR president, told the committee. "It appears not to astound anyone to be told that he must wait for the delivery of a new automobile, but the necessity for occasional patience in awaiting the availability of a freight car is too frequently pictured in the light of outrage. The car shortage is only a transitory phase of the return from conditions of war. The sure and lasting remedy is more cars."

## "Promotion" Work Probed

An investigation now in progress on the Hill and about which more probably will be heard later is bringing out details as to how government officials help create pressure organizations to make demands on Congress. Man in charge of this investigation, Rep. Forest A. Harness (Rep., Ind.), chairman of the Publicity and Propaganda Subcommittee of the House Committee to Investigate Expenditures in the Executive Depart-

# Need a Special Cutter in a Hurry?
# . . . you can make it on a

## CINCINNATI MONOSET

*Above:* The taper shank cutters at the rear were made—or ground from the solid if you prefer—*from scrap,* on a CINCINNATI Monoset Cutter and Tool Grinder. The other cutters and the two "chessmen" were also ground on a Monoset.

*Right:* Grinding a radius on a helical end mill. At the same chucking, the diameter and face of the teeth are also ground. The machine is a CINCINNATI Monoset Cutter and Tool Grinder.

● There's no need to tie up expensive production machinery while waiting for a cutter replacement. You can make the cutter right in your own shop on a CINCINNATI Monoset Cutter and Tool Grinder.

Take a piece of suitable steel, or a larger broken or scrap cutter, grind it to shape, grind the flutes, and then sharpen in the conventional manner. One *chucking* does the whole job. Small intricate cutters . . . the kind which you ordinarily order as special items . . . can readily be made in this manner. Because of its versatility in making cutters as well as in sharpening them, the CINCINNATI Monoset offers the possibility of quickly paying for itself. This is one of its many advantages. ¶Would you like to know more about the Monoset and how it grinds straight, taper, and ball-nose cutters? Write for catalog M-1386.

See the CINCINNATI MILLING DISPLAY at the MACHINE TOOL SHOW, Chicago, Sept. 17-26

## THE CINCINNATI MILLING MACHINE CO.

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ments, has declared many of these activities to be illegal in that they involve the expenditure of public funds for purposes not approved by Congress.

Of special interest to business men is the proof developed in these hearings of the close teamwork between labor unions and prominent government officials in working toward common objectives. The subcommittee's record contains copies of letters in which government officials address labor union officials by their first names—or nicknames—and in which they ask the labor people to criticize—in advance of their publication or final formulation—government pamphlets and policies. The CIO has been especially active and successful in lining up close contacts of this kind.

The program that particularly aroused the ire and concern of the subcommittee was the organization of "Health Workshops" in rural areas to get the farmers of the country to press for socialized medicine—that is, enactment of the Wagner-Murray-Dingell health insurance bill.

Typical is the organizational meeting at Jamestown, N. Dak., Sept. 27-30, 1946. Testimony showed it to have been arranged jointly by the Farmers Union, the CIO, AFL, and Railroad Brotherhoods organizations of North and South Dakota. While these organizations did the spade work, the program was in charge of two policy-making officials from Washington—Dr. Mayhew Derryberry from Public Health and Dr. Hubert Stanley Coffey of the Federal Security Agency. And it was shown that labor union and federal employees slated to take part in the meeting were primed beforehand by sending them, from Public Health headquarters in Washington, a "packet" of prepared material. This included CIO and AFL, Department of Agriculture and Social Security Board pamphlets pointing out reasons why the Wagner-Murray-Dingell bill should be voted into law.

The subcommittee has asked the Comptroller General to compile a record of expenses paid out of government funds to implement such "propaganda" activities.

## New Tin Allocations To Be Set

Because no additional tin supplies had become available, the Combined Tin Committee at its meeting on June 12, 1947, set final allocations for the first half of 1947 at the levels previously announced on an interim basis.

The committee is scheduled to reconvene on July 1, when it is expected that interim allocations for the second half of 1947 will be made. The committee also announced that all procurement against first half allocations should be completed by July 31, 1947, at which time unsold tonnages will revert to the pool for reallocation unless buyers and sellers can demonstrate there are extenuating circumstances warranting extension of time for individual cases.

**AIR SAFETY BOARD MEETS: President Truman's special board of inquiry into air safety. Left to right are: H. P. Cox, member of Air Line Pilots' Association; Brig. Gen. Milton W. Arnold, vice president, Air Transport Association; James M. Landis, chairman of board and chairman of Civil Aeronautics Board; T. B. Wright, administrator, CAA. NEA photo**

## Scrap Still Must Be Returned

The federal government has assured the steel scrap and scrap consuming industries there will be no relaxation or other change in present requirements that scrap metal sold overseas by government agencies must be returned to the United States.

Robert W. Wolcott, chairman of the Steel, Foundry and Scrap Industries Committee on scrap, last week made public letters from the War Department, and from John R. Steelman, assistant to President Truman, refuting reports that a change in this requirement was coming in October.

Mr. Steelman said "any such expectation is without foundation."

Mr. Wolcott charged that some scrap supplies were being retained overseas by United States purchasers in the expectation that the requirement for shipment back to this country would be dropped by October, and shipments could then be disposed of in other markets.

## To Direct Labor Peace Study

Charles R. Walker, director of labor-management research, Yale University, and Joseph Scanlon, Industrial Relations Department, Massachusetts Institute of Technology, have been appointed co-directors of a study for the National Planning Association on the causes of labor peace.

The labor-management history of some 15 selected industrial corporations will be investigated to determine what policies cause discord and what policies produce harmony. The findings, it is hoped, will prove helpful to the many corporations that in the past have suffered from labor troubles.

## Jap Lead Scrap To Be Sold

The government will sell approximately 550 short tons of lead scrap received from Japan on sealed bids shortly after July 14, the RFC announced last week. The scrap lead may be inspected at Seller's Warehouse, Staten Island, N. Y.

# Steel and Equipment Exports Could Aid in Preventing New World Crisis

***Exporter urges United States ship machinery, steel and steel products to certain foreign countries to establish this country as source of supply and to assist less developed nations build self-sustaining economies***

By CHARLES A. KOONS

STEEL, steel products and machinery exported to certain foreign countries now may go far toward shaping history for years to come. Rails, railroad equipment and tools placed in the hands of neighboring and friendly nations within the next few years may do more to stem any tendencies toward undemocratic "isms" than propaganda and preaching. Why? The reasons seem fairly simple.

In the first place, history has a way of repeating itself. Right after World War I, we had an opportunity to help South America and the Far Eastern nations with materials and services. We could very well, at that time, have established ourselves as the major source to meet their basic needs for steel and steel products. We failed to take advantage of that opportunity with the result that South American and Oriental trade went far toward helping in building the economies of both Japan and Germany. Those two nations came rapidly to the fore industrially.

Meanwhile, the nations which had previously depended on agrarian economies did not change. Regardless of other factors, they lacked the tools to change. For our part, we failed to do very much about providing them.

### Fascism Flourished

So, shortly afterward we began to see the rise of such men as Hitler, Mussolini and Franco and the various dictatorships in South America. Nations which turned toward Fascism were almost entirely those which based their existence principally on agriculture. As has always been the case, they found themselves unable to compete with industrial nations. As a result they resorted to abortive efforts to improve their positions.

In the past 27 years the wheel seems to have taken another complete turn. We find ourselves in very much the same situation with this difference: Today there is, really, only one major industrial nation—the United States. Formerly there were four. Competing with us for world markets were Great Britain, Germany, Japan. That is no longer the case. Great Britain has a long way to go before she, for example, becomes a major factor in postwar markets for industrial materials such as steel products.

Germany and Japan are out of the running for the time being. We are in the unusual position of controlling not only the sale and distribution of steel, but the world's money market as well. Thus we occupy a seat from which we may dictate the course of world events for some years to come. Not only that, we can indicate, with a nod, which nations shall—and which nations shall not

**Mr. Koons is head of Charles A. Koons & Co., New York, large exporter and importer of steel products and equipment. Comments on Mr. Koons' remarks are invited.**

—come to the industrial fore in the next few decades.

In the meantime, our neighbors to the South and the peoples of the Far East are looking to us for assistance. While possessing untold and untapped natural resources, many of them are struggling valiantly to establish self-sustaining economies. But, in doing so, they must have help. And, we are the only people in a position to offer it.

Consider South America. During the recent war, we depended on its raw materials to a large extent. On the other hand, the Latin-American nations had to look to us for machinery and tools. This, too, at a time when we were in a poor position to export. But, it had to be done, not only as a part of our established good neighbor policy, but for our own eventual benefit as well.

Nevertheless, the quantities of steel, steel rails, railroad equipment and machinery we were able to send satisfied only a small part of South America's requirements. Significantly, 62 per cent of the exports to Latin America in 1946 consisted of these products, plus some automotive vehicles.

Now, Latin America wants more materials and equipment. Several countries are, for example, eager to build hydro-electric plants in their mountainous areas. Areas, too, where within reasonable distance industries employing that power could be established. But, 550-ton armatures cannot be flown into remote spots by plane. Nor can they be packed in by mule. Obviously, ahead of the generators and construction materials must come the rails, locomotives and cars to convey them. And, similarly, before surrounding industrial plants can be established, there must be some means of transporting materials and equipment.

These same steel rails and railroad equipment are needed for other—and even more pressing—situations. We are shipping quantities of commodities to South American ports.

In the Far East—notably in China—the situation is even more acute. China stands in desperate need of rails for 30,000 miles of track. Her problem is not alone industrial. It is even more fundamental than that.

Many times in recent years famine has devastated vast areas of China. The most horrible recent example was the food shortage—due to crop failure—in Szechwan Province, where 100,000 persons starved. At the time the sympathy of the entire world was aroused. Preparations were made to ship quantities of food to the stricken people. But all of that was a futile gesture. There was plenty of food only 200 miles from Szechwan. But it could not be transported this brief distance—about that between New York City and Boston. A single freight train, which could have made the run in less than seven hours, would have carried enough food to have sustained these people for six weeks.

### China Needs Help

Today, China is practically pleading with us to aid in preventing another such disaster. In the long run she wants also to establish herself industrially. We have heard for years of the vast untouched natural wealth of China. But we have done little to help develop it.

Following the first World War, we saw the rise of two major industrial nations—Germany and Japan. Later these two combined to threaten our very existence. There is no reason to believe that they will not try again—if ever given the opportunity. By aiding friendly countries to become industrialized now we will make them independent of potential enemies, make them look to us, rather than elsewhere in the world for their own betterment.

Steel, steel products and machinery exported to certain foreign countries today may help to shape history for some years to come. The help we can now show those who have proved themselves good neighbors in our time of stress may very well cement relationships which will stand us in good stead in the difficult decades ahead.

# Present Depreciation Reserves On Machinery Held Unrealistic

***Machinery & Allied Products Institute meeting's speakers assert new replacement reserve policy needed to prevent erosion of capital. Searle elected vice president succeeding Stilwell who moves to advisory committee***

CHANGE in method of handling depreciation of fixed assets, not only in manufacturers' bookkeeping, but also in Treasury Department regulations affecting income tax returns, was advocated by Herbert H. Pease, president, New Britain Machine Co., New Britain, Conn., and head of the National Machine Tool Builders' Association, at the annual meeting of the Machinery & Allied Products Institute in New York June 19.

Prevalent practice of setting up depreciation reserves on fixed assets is not realistic and reserves so set up are inadequate to provide for replacement, he averred. If company books agree with income tax returns, he said, a depreciation of about 6 per cent annually on the original cost of machine tools is taken; a machine costing $5000 sixteen years ago cannot be replaced for $5000 today, but that is all the Treasury allows toward replacement over that period. This type of formula results in erosion of capital, under-estimating of costs and probably under-pricing of goods, he added.

### Deters New Purchases

Industry is discouraged from purchasing modern cost-reducing machinery, knowing it cannot get back the cost of replacement in dollars of the same purchasing power or get the tax reduction to which it is entitled. Some companies keep two sets of books to determine a realistic write-off each year; others strive to make tools pay for themselves over a short period of years and set up additional reserves for replacement out of these taxable profits. These measures, however, are unfair to the companies, in Mr. Pease's opinion.

The effect of manufacturers' resistance to new machinery because of this unfair depreciation policy is a decrease in tool builders' volume with attendant increases in machine tool prices and higher investments per unit at a time when tool builders' costs are up and few shops producing only machine tools are making profits.

A new approach to the concept of depreciation is needed, he asserted. The amount that would be lost originally in taxes would be a small matter, Mr. Pease pointing out nothing would be lost if a 100 per cent write-off was allowed annually except the interest in the first year on about 38 per cent of $250 million, if that volume of machine tools was sold. Eventually, the initial tax loss resulting from write-off of the equipment in a year's time would be offset many times by taxes on future increased profits accruing to users.

By encouraging the use of cost-reducing machinery, the government could go far toward its objective of maintaining national income at the current high level. And users of machines would be protected against dissipation of their capital and could have confidence that in buying machine tools they would be permitted to set aside replacement reserves in dollars of the same purchasing power.

HERBERT H. PEASE

The machinery meeting, which had as its keynote more production for a better world and was attended by 350 industrialists, was presided over by William J. Kelly of Chicago who declared speculative investment is vital to technological progress. This investment, he said, is handicapped by (1) federal tax policies which do not permit free depreciation and full offset for losses; (2) trade union restrictions on the use of machinery in manufacturing; (3) haphazard depreciation and replacement policies in many companies; and (4) lack of understanding by the government, industry and public of the relation of capital goods demand to the business cycle.

Use of federal taxes and expenditures to compensate for inflationary or deflationary swings in the national economy was recommended by George Terborgh, economist and director of research for the institute. While the compensatory policy was opposed by business economists when advocated and tried in the 1930s, Mr. Terborgh said a federal budget of $30 billion or more is of such colossal proportions it is "a potential engine of tremendous importance in economic control."

Other speakers included: George P. Torrence, president, Link-Belt Co.; Harold W. Story, vice president and attorney, Allis-Chalmers Mfg. Co.; Representative A. S. Mike Monroney of Oklahoma; Vice Admiral Edward Lull Cochrane, chief, Materiel Division, Navy Department; and Dr. Charles O. Hardy, staff director, Joint Committee on the Economic Report, United States Congress.

Officers of the institute were re-elected with Clarence E. Searle, president, Worthington Pump & Machinery Corp., New York, becoming vice president, succeeding Charles J. Stilwell, president, Warner & Swasey Co., Cleveland, who moved to the advisory committee. New members of the executive committee are Robert B. McColl, president, American Locomotive Co., New York, and Herbert L. Watson, president, DeLaval Steam Turbine Co., Trenton, N. J., who has been serving on the advisory committee. Moving from the executive committee to to the advisory committee are Duncan W. Frazer, chairman, American Locomotive Co., and Maurice F. Dunne, president, Pyott Foundry & Machine Co., Chicago.

## Finds Need for Speed-up In WAA Machine Tool Sales

Machine tool hearings of the Surplus Property Subcommittee, Senate Small Business Committee, have been lagging due to the busy schedule of the chairman, Sen. Homer Ferguson (Rep., Mich.).

However, the subcommittee staff, headed by Miles N. Culihan, has dug up considerable information to the effect that disposal of surplus machine tools is being unduly delayed and needs to be speeded up if the government is to get any return on its remaining large inventory. Later, according to present plans, the subcommittee will conduct hearings in Chicago, Detroit and New York and possibly in some other centers.

Recent hearings have been on the slowing down effect of the machine tool disposal program of the War Assets Administration due to the tagging of tools to be set aside for the JANMAT (Joint Army-Navy Machine Tool) program. This program, the subcommittee feels, has not been directed properly and a good many tools that have been

tagged really should be sold—if not for use as machine tools, then for scrapping.

The subcommittee has a promise from the WAA that the machine tools in WAA Warehouse No. 3 in Detroit will be placed on the market and sold in July; latest inventory indicates there are some 29,000 machine tools at that spot.

## Starts Summer Training For College Undergraduates

Some 300 undergraduates from colleges in all sections of the United States are this summer participating in a training program at the steel mills of Carnegie-Illinois Steel Corp. in the Pittsburgh and Chicago districts.

The potential engineers, selected under a plan devised to reduce from five to three years the practical training period required to make a new college graduate a full-fledged engineer, have been assigned regular jobs at appropriate wages at each Carnegie-Illinois mill in the two steelmaking districts.

The students will be graded by their supervisors, and their performance will be filed for reference when they return to work next summer on a job of greater technical content.

## Toulmin Stresses Need for New Products and Methods

Manufacturers who continue "to make the same old products, in the same old way, year after year," will find they are producing themselves right into a depression, Col. H. A. Toulmin Jr., president, Hydraulic Press Mfg. Co., Mt. Gilead, O., writes in the current issue of "Press Proofs," the company's monthly publication.

Too many manufacturers, Colonel Toulmin states, run the danger of seeing their cherished products subside into industrial relics because they have become too proud of their products and too attached to their equipment.

Far wiser, in his opinion, "is the manufacturer who understands that there is nothing so constant as change; who brings out new models in advance of the demand and creates for his aggressive company the first market on an annual, recurrent basis." As a case in point, a chart comparing automobile production with total industrial production from 1920 through 1941 accompanies the article. Annual new models in this industry have meant new business and more rapid recovery from downtrends.

## Radio Receiver Production Shows Decline in May

Radio production in May dropped to 1,316,373 receivers of all types from 1,548,540 in April, the Radio Manufacturers Association reported.

The decline was not unexpected, said the association, pointing out the industry had estimated 1947 output at 15 million sets and that on the basis of production in the first five months of 7,397,502 units the aggregate output for the year would be 18 million.

**DISCUSS MACHINE TOOL PROGRAM: Walter I. Brown, right, War Assets Administration, talks over the WAA's machine tool donation program with P. B. Bass Jr., University of Chicago Purchasing Department, as it is inaugurated at the Nash-Kelvinator plant in Kenosha, Wis. More than $160,000 of surplus tools were given to schools and municipalities in five states in the first distribution**

# Continuing Fair Volume of Tool Building Seen

***Speaker at machinery dealers' convention predicts a $300 million year. WAA charged with bungling***

CONSIDERABLE new machine tool buying appears in prospect as the metalworking industries attempt to lower production costs, increase productivity and introduce new products, Burnham Finney, editor, *American Machinist*, told members of the Machinery Dealers' National Association at its sixth annual convention in Cincinnati recently. Speaking on "What's Ahead in Metalworking," Mr. Finney predicted the machine tool industry will do a business of $300 million this year, with output continuing near the present rate over the remainder of the year. "Even though current sales do not support such a rate," he said, "backlogs will provide the extra incentive."

"Offhand, the $300 million of business this year sounds like a lot," he continued, "but in view of plant facilities for building $600 million of machines, and after taking into account increased prices, present-day operations do not seem so favorable. . . Many companies have taken on contract work to keep their plants and employees busy; others have added products other than machine tools."

In 1948, he predicted, more new orders may be received than in 1947, such new ordering amounting to at least $250 million. Even 1949's volume of business should be "fairly good," he said, and "should run along not too far below the present volume."

Charges of inefficiency and bungling in the disposal of surplus machine tools were leveled against War Assets Administration by Harvey H. Goldman of Detroit, president of the association. Sales of $285 million worth of surplus tools by WAA-approved dealers to the present time could have been multiplied several times "if WAA had been in a position to clear its paper work and make prompt deliveries and show some semblance of a business-like approach to the problem," he said.

Other practices for which WAA has been critized, according to Mr. Goldman, include: Paying of commissions and discounts to dealers for selling machine tools in active demand; site sales with their attendant confusion and discrimination; and lack of co-operation on the part of dealers who have not put enough sales effort into long-supply tools.

# CARE-FREE BEARING PERFORMANCE THROUGH THE YEARS

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With such long and care-free performance records to recommend them, no wonder Hyatt Roller Bearings are preferred and so widely used. If there is any application data you want, please ask for it. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

**HYATT ROLLER BEARINGS**

By A. H. ALLEN *Detroit Editor, STEEL*

# Mirrors of Motordom

***Near record production of cars and trucks seen possible this year with well over 5 million units projected. Trucks amount to almost one-fourth of total, highest proportion ever attained. Replacement parts volume stays high***

*DETROIT*

INVENTORY of the automobile industry's production record for the first six months of this year suggests assembly totals for the full year will exceed the high level of 1941 and possibly come close to the all-time high mark of 1929. In the first three months, 1,215,382 cars and trucks were built. April registered a new top for the year, May declined 60,000 units because many steel inventories were eaten up, while June recovered to an estimated 424,000, bringing the indicated six-month aggregate to nearly 2,500,000. Assuming production for the third quarter holds to the current level, and a slight increase is possible in the fourth quarter, then the year will see well over 5,000,000 vehicles assembled.

Statistically, this figure represents a creditable performance, and with the interpretations which must be added to reflect the true situation, it is a manufacturing achievement never before realized. For one thing, the proportion of the total accounted for by trucks has never been so high—close to 25 per cent—which means that in terms of actual poundage of manufactured product, the total represents far more than the unit figures would suggest. Add to this the enormous volume of replacement parts production which is continuing, and the overall total is well beyond past records.

### Parts Volume Breaks Record

For example, in 1933, replacement parts' wholesale value was $234 million, in 1937 it had increased to $462 million, in 1941 to $718 million, last year to $1753 million, and this year probably to $2200 million. Even recognizing the fact that dollar figures must be adjusted to give consideration to an approximate 50 per cent inflation since 1939, still the outpouring of replacement parts eclipses anything yet witnessed. Field reports indicate a mild softening in demand for certain types of parts, but in general, production is holding to the record level. Sheet steel parts, like fenders for example, needed on 1940 and 1941 passenger cars which are slowly rusting apart, in many cases are unobtainable.

A preview of the annual compilation of industry facts and figures, issued by the Automobile Manufacturers Association, confirms the above parts production history, and also reports other interesting basic statistics. For example, the employment trend in production workers—471,000 in 1929, 257,000 in 1932, 505,000 in 1937, 570,000 in 1941 and 661,000 last year. To this total must be added another 178,000 salaried working people.

## Automobile Production

**Passenger Cars and Trucks—U. S. and Canada**

*Estimates by Ward's Automotive Reports*

| | 1947 | 1946 |
|---|---|---|
| January | 373,872 | 126,082 |
| February | 399,717 | 84,109 |
| March | 441,793 | 140,738 |
| April | 449,388 | 248,108 |
| May | 390,629* | 247,620 |
| June | ..... | 216,637 |
| July | ..... | 331,000 |
| August | ..... | 359,111 |
| September | ..... | 342,969 |
| October | ..... | 410,510 |
| November | ..... | 380,664 |
| December | ..... | 380,908 |
| 12 ms. | ..... | 3,268,456 |

* Preliminary.

**Estimates for week ended:**

| | | |
|---|---|---|
| June 7 | 98,499 | 45,043 |
| June 14 | 97,943 | 50,206 |
| June 21 | 103,278 | 54,475 |
| June 28 | 105,000 | 66,913 |

No doubt few persons could come even close on a guess as to the annual tax bill collected from automobile users, also at an all-time high. It adds up to well over $2.5 billion—$551 million in registrations, $1065 million in state gasoline taxes, $796 million in federal excise levies, and $95 million in other classifications. A campaign has been started in Washington to convince legislators the automotive excise tax is working too severe a hardship on new car buyers, a position which industry leaders have taken for several years to no avail.

## Truck To Be First New Ford

Ford has already spent an estimated $17 million on new dies, tools, jigs and fixtures for its 1948 line, according to E. R. Breech, executive vice president. First of the line will be new truck models, to appear late this fall. Next will come the new Mercury and Lincoln models, and finally the Ford itself, sometime after the turn of the year. Ford will change from the transverse-type rear spring used for many years to conventional longitudinal leaf springs, with coil springs in the front suspension. Experiments had been conducted with torsion bar springing, but the resultant ride was too "stiff" to suit company officials and engineers.

## Trucks Emphasize Comfort

Chevrolet last week also announced details of its new trucks and commercial cars, featuring a number of improved features for the comfort and safety of drivers. Cabs are 8 inches wider and 7 inches longer, with larger windshield and windows. Seat is fully adjustable and moves forward or backward on an inclined plane. An improved ventilating system draws fresh air from the outside and forces used air out through vents at the rear of the cab, minimizing fogging of glass.

The trucks are built in a variety of models on nine wheelbases, and gross vehicle weight ranges from 4000 to 16,000 pounds. The truck cab is completely welded and features three-point suspension for better riding comfort. Hood design has been altered, now being of the alligator type, while fender styling likewise has been changed in the interests of greater strength and greater durability.

Demonstrating how trucks now cater to the esthetic, the Chevrolet deluxe panel body has stainless steel windshield reveal and window garnish and reveal moldings, as well as chrome-plated radiator grille and chrome-plated fender moldings, to say nothing of arm rests on doors and right and left hand sun visors.

Frames of all heavy-duty types are entirely new. Use of frame reinforcements has been discontinued since both section modulus and size of the frame elements have been increased, siderails for example now being 8⅞-in. deep, with 2⅞-in. flange and ¼-in. thick.

## Chevrolet Plant Is Unique

First of two new postwar assembly plants to go into operation, the Chevrolet-Flint unit was opened for general inspection last week, revealing a new method of handling car and truck chassis in

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process, known as "suspended assembly." Instead of the chassis progressing along the assembly line on a floor level conveyor, it is hung from an overhead monorail conveyor, bringing the work to the employee at bench level and permitting right-side-up assembly of the chassis and free access from all sides. Of the 4½ miles of conveyors installed in the plant, only ½-mile is of the floor type, illustrating the degree to which the overhead system has been used.

Capacity of the plant is 80 units per hour and operations have been under way for about 30 days, gradually picking up speed as the 3500 employees become familiar with the assembly techniques involved. The layout includes ten buildings located on 104 acres of property just outside the Flint city limits. Floor area totals 1,250,000 square feet, including the Chevrolet operations and those of an adjoining Fisher Body unit. There are two passenger car and one truck assembly lines.

The assembly building proper is the heart of the facility, with two operating levels and covering an area of 663 x 1000 ft. Center main assembly bay is 60 ft wide by 60 ft high. The second floor, a balcony effect, surrounds the main bay and is largely devoted to paint and trim operations and truck cab building.

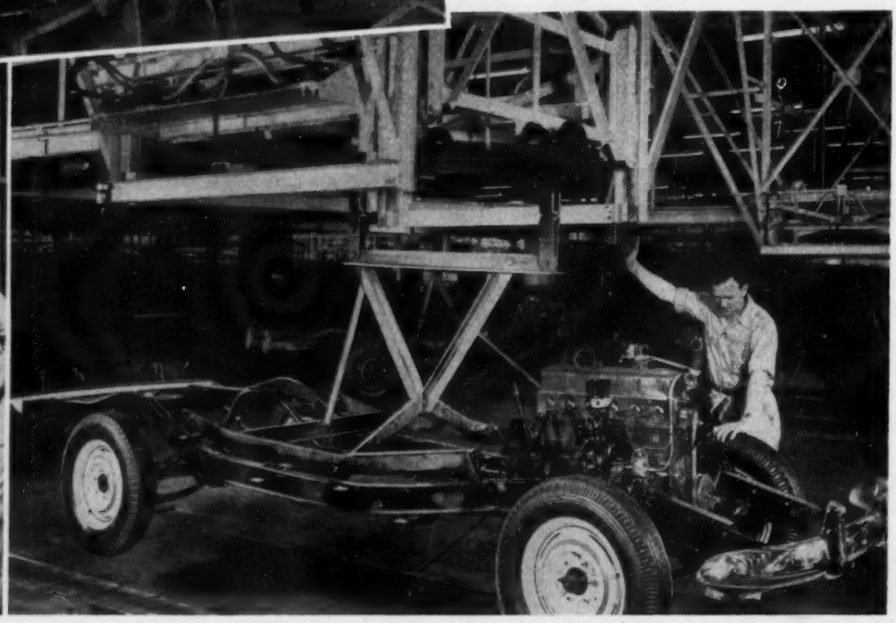
Unique in plant layout, according to Chevrolet engineers, is the final assembly line "switch," with two lines progressing from dual body drop position. A single chassis line supplies the dual final lines, which are paced at one-half the speed of the chassis conveyor.

Finished cars are driven off assembly lines onto a pneumatically operated parallelogram which automatically checks and trues wheel alignment. At the same station, headlights are adjusted with the aid of photoelectric cells, after which vehicles are driven onto a test track behind the plant for preliminary road check.

Another "first" claimed for the plant is the "power-and-free" conveyor system employed at several points. In the "power" phase, the power chain for the conveyor system makes direct contact with and moves the carrier. In the "free" phase, the chain loops up away from the carrier and permits it to be moved by hand, thereby enabling assembly workers to pace the rate of flow.

An elevator device at the start of the line is another innovation. An empty frame carrier is brought into position at a level higher than the conveyor itself. It is moved into a rack which automatically lowers it to the proper position at the start of the line. A similar elevator operates at the end of the chassis assembly line to lift the empty carrier to the return line.

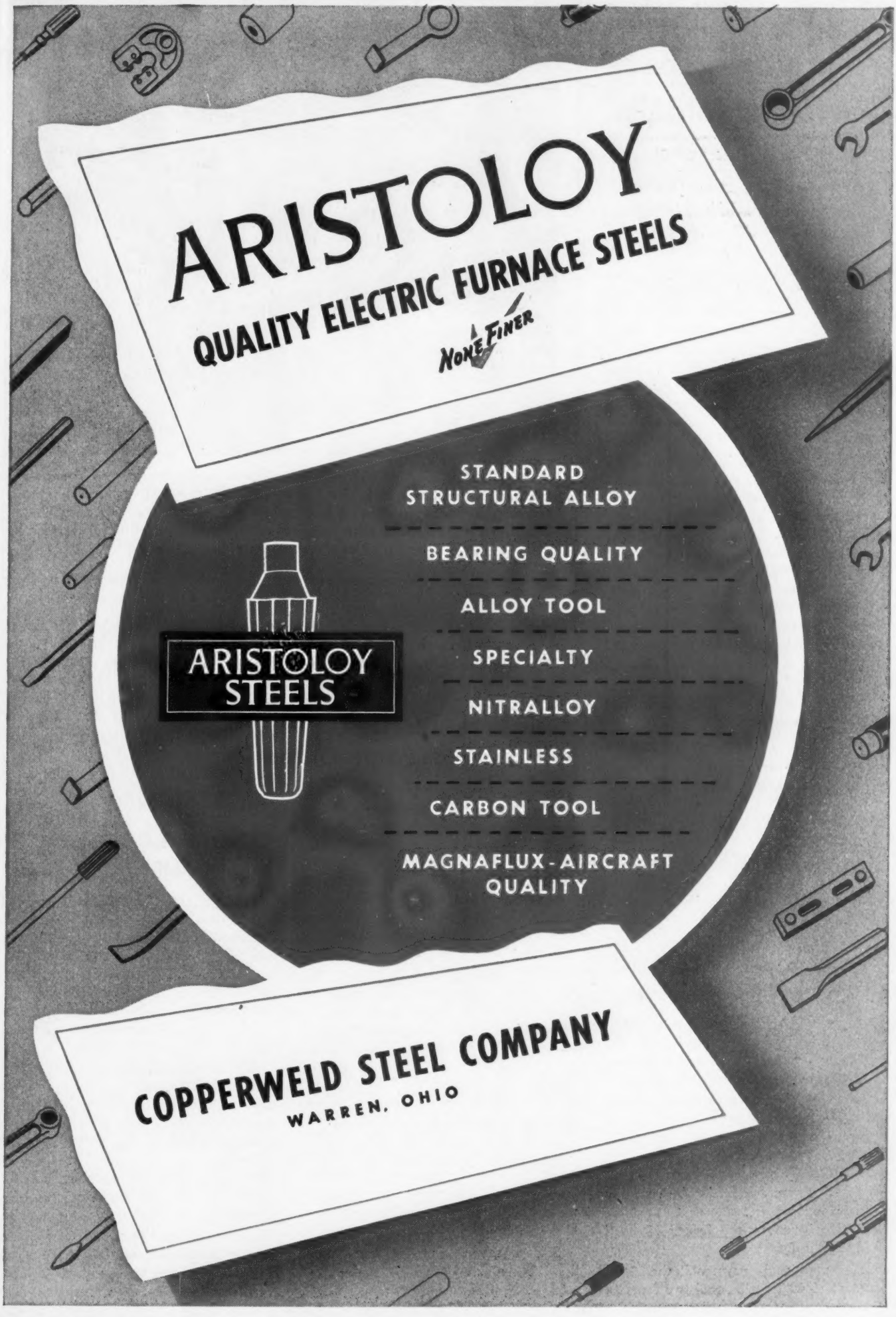
A second new Chevrolet assembly plant will be completed and operating in the fall at Van Nuys, Calif., making a total of 11 assembly centers throughout the country, all of them supplied by 20 manufacturing plants.



*Frame is hoisted into position, left, to start its trip down the "suspended" assembly line for car and truck chassis*

*Workmen, lower left, spot welding truck cowl assembly. A battery of 42 individual welding units is operated in the truck cab and panel body shop*

*Completed chassis, below, being lowered from the overhead assembly conveyor to floor conveyor for final assembly of body and chassis*


ARISTOLOY
QUALITY ELECTRIC FURNACE STEELS
NONE FINER
STANDARD
STRUCTURAL ALLOY
BEARING QUALITY
ALLOY TOOL
SPECIALTY
NITRALLOY
STAINLESS
CARBON TOOL
MAGNAFLUX-AIRCRAFT
QUALITY
ARISTOLOY
STEELS
COPPERWELD STEEL COMPANY
WARREN, OHIO

# Carnegie-Illinois Announces Four Low-Alloy Steels

***Steels developed for aircraft and aviation industries and represent considerable alloy reduction***

FOUR new steels developed in the past two years for use in the aircraft and heavy automotive industries have been announced by Carnegie-Illinois Steel Corp., United States Steel Corp. subsidiary. These steels, according to corporation officials, are designed for gears, shafts and pinions used in planes, busses, trucks and heavy-duty industrial machinery.

Named "SuperKore" to emphasize the core strength produced from surface-hardening treatment, the steels represent a considerable alloy reduction although Carnegie-Illinois officials pointed out that the switch to a lower-alloy series was achieved without reducing physical properties required for heavy-duty parts. Economies in material costs were indicated by the officials, as well as manufacturing savings achieved by improved carburizing characteristics and greater ease in annealing and machining.

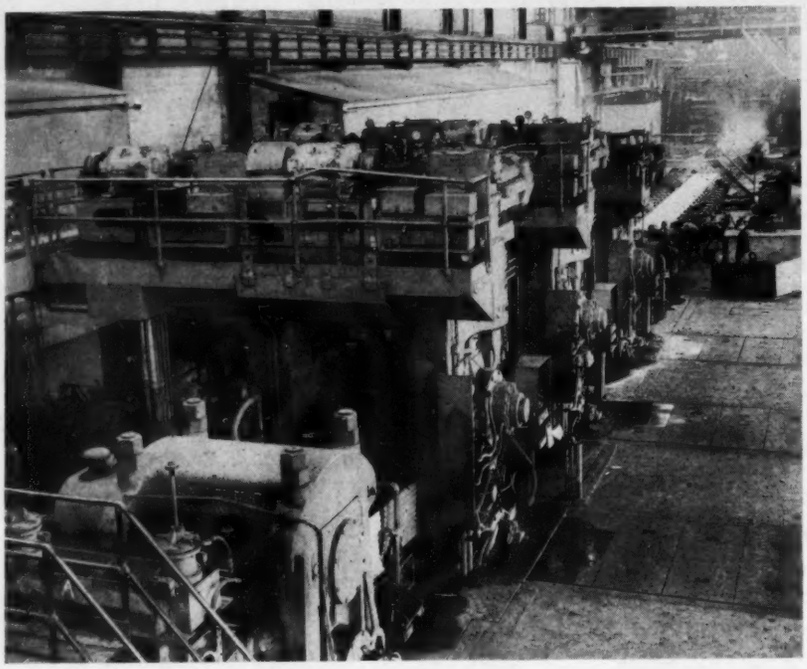
The new steels will be made in four different grades:

U.S.S. SuperKore A for heavy plane parts.

U.S.S. SuperKore AA for truck and tractor parts.

U.S.S. SuperKore B for large carburized parts commonly used in heavily loaded gears, shafts and pinions.

U.S.S. SuperKore C for use in miscellaneous heavy industrial machine parts.



**NEW STRIP MILL: Republic Steel Corp.'s new 48-in. strip mill in Youngstown has just started production. The mill, made by adding three 4-high finishing stands to the present 84-in. plate mill, will roll skelp for Republic's three electric weld tube mills at Youngstown and strip for further processing at the company's Niles, O., plant**

## Allegheny Ludlum Pays Out $2 Million in Record Payday

In the largest single payday in its history, Allegheny Ludlum Steel Corp. last week paid more than $2 million to over 18,000 present and former employees.

The special payday was for the purpose of making payments as a result of inequalities in wage rates during the period from Jan. 4, 1944, through March 31, 1947. This part of the settlement, which was agreed upon by the company and its workers, is in accordance with a directive issued by the former National War Labor Board.

An additional payment, the total amount of which will equal two cents an hour during the affected period, will be paid later to employees whose wages during that period have been determined to have been below present rates.

## Alabama Plans for Latin American Trade Program

Alabama businessmen are planning a Latin American trade program which contemplates acquisition of a surplus craft from the Maritime Commission to be outfitted as a display ship for some 4000 Alabama-manufactured articles. A five to seven month tour of South America with manufacturers' agents, bankers and others aboard has been proposed to start in November or early December.

Present plans call for the state to pay for outfitting the ship, and manufacturers to bear operating and incidental costs. Initially, the program will need an estimated $750,000.

## Carnegie Tech Plans To Build 200 Million Volt Cyclotron

Carnegie Institute of Technology, Pittsburgh, has announced recent contributions of $280,000 make it possible to realize plans for a 200 million volt synchro-cyclotron.

Savings made on equipment offered by Westinghouse Electric Corp. at special prices, plus a contract from the U. S. Office of Naval Research in support of the project brought the total value of these contributions to $280,000, fulfilling conditions of a $300,000 appropriation received by Carnegie Tech from the Buhl Foundation of Pittsburgh last December. The foundation stipulated that its grant be supplemented by subscription of at least $250,000 toward the cyclotron from other sources.

## University Will Sponsor Labor Relations Conference

Labor relations will be the theme of a midwestern conference on Industrial Management to be held at the University of Missouri, Columbia, Mo., Oct. 23-25, Frederick A. Middlebush, university president, has announced. The university will sponsor the conference in co-operation with organizations representing 2000 Missouri industries.

Already scheduled to address the gathering are: Frank Rising, general manager of Automotive & Aviation Parts Manufacturers, Detroit; and Glenn Gardiner, president of New Jersey State Chamber of Commerce. Mr. Gardiner will discuss foreman training and the problems of foreman organization.

Although primarily designed for industrial policy-making and administrative officers, conference registration will be open to all persons interested in labor relations or industrial management.

# BRIEFS . . . .

***Paragraph mentions of developments of interest and significance within the metalworking industry***

**War Assets Administration,** Chicago, announces the inauguration of a campaign to interest agricultural associations and other farmers' representatives in surplus equipment. The program will endeavor to show the farmer uses he can make of surplus tubing, wire cables and electrical equipment.

—o—

**Kennametal Inc.,** Latrobe, Pa., has appointed Laurent Industrial Development Co., New York, as representative for its mining tools in France, the French Empire, protectorates and mandates, the Saar, Spain and Italy. Kennametal has also appointed Lundwall & Co., Goteborg, Sweden, as a distributing representative in Sweden for the company's line of cemented carbide tools.

—o—

**Aetna Standard Engineering Co.,** Youngstown, is closing its Warren, O., and Ellwood City, Pa., plants July 4 to July 13 for vacations.

—o—

**Carnegie-Illinois Steel Corp.,** Pittsburgh, subsidiary of U. S. Steel, reports that in 12 of its plants it had operated without a single lost-time accident over a combined period of 25 million man-hours of working time.

—o—

**Pratt & Whitney Aircraft,** East Hartford, Conn., division of United Aircraft Corp., will be closed Aug. 22 to Sept. 2 for the purpose of taking inventory.

—o—

**Chesapeake & Ohio Railway,** Cleveland, announces that Baldwin Locomotive Works will deliver to it in August a steam turbine-electric passenger locomotive that converts coal into electrical energy for its wheel drive and develops 6000 hp.

—o—

**Surface Combustion Corp.,** Toledo, O., manufacturer of industrial furnaces, is closing its shop June 28 through July 13 for vacations and physical inventory.

—o—

**U. S. Machine Corp.,** Lebanon, Ind., manufacturer of Winkler domestic, commercial and industrial stokers, has licensed Champion Coal Co., Pittsburgh, an affiliate of Consolidation Coal Co., to sell the stokers in the Pittsburgh area.

—o—

**Sawhill Mfg. Co.,** Sharon, Pa., producer of prefabricated pipe, has recently completed a plant expansion program.

—o—

**Douglas Aircraft Co.,** Santa Monica, Calif., has been awarded an Army Air Forces contract to conduct a design study on supersonic aircraft. The study will be directed toward the development of a design capable of speed three times that of sound and with an altitude ceiling of 200,000 to 300,000 ft.

—o—

**Alabama** announces that the state's coal production for the first five months of 1947 was 7,462,000 tons. Output for the same period last year was 5,425,000 tons.

—o—

**Pennsylvania Salt Mfg. Co.,** Philadelphia, has outlined tentative plans for an expansion program costing approximately $7,500,000. Stockholders are being asked to vote at a special meeting July 3 on financial arrangements for the project.

—o—

**Revere Copper & Brass Inc.,** New York, will close its Revere mills during the first week of July for vacations. Mills of its Dallas and Chicago divisions will be shut down for the first two weeks of next month.

—o—

**Evans Products Co.,** manufacturer of freight-loading devices and automotive equipment, has moved its sales and administrative offices and manufacturing facilities from Detroit to Plymouth, Mich.

—o—

**Twin Coach Co.,** Kent, O., produced 184 busses in May, equaling its all-time record set in April.

—o—

**American Electroplaters' Society,** Jenkintown, Pa., has established a research project on the disposal of plating room wastes, which will be conducted at Yale University, New Haven, Conn. This is the tenth of a series of projects set up as fellowships or grants at leading universities and research institutions.

—o—

**Illinois Tool Works,** Chicago, manufacturer of metal cutting tools, fastening products and electronic heating equipment, celebrated the 35th anniversary of its founding recently at a dinner meeting which featured recognition of 54 employees who had completed 25 or more years of service with the organization.

—o—

**McGrath Steel Co.,** supplier of reinforcing steel and wire mesh, has moved its office and plant to 6655 Hollis St., Emeryville, Calif.

—o—

**Minneapolis-Honeywell Regulator Co.,** Minneapolis, manufacturer of controls, regulators and allied products, has formed a subsidiary in Mexico, Honeywell-Brown S.A. with headquarters in Mexico City. Honeywell operates similar subsidiaries in England, Belgium, the Netherlands, Sweden and Canada.

—o—

**Chicago Belting Co.,** Chicago, manufacturer of belting and rubber molded items, has transferred its Aero-Sol Rubber Products Division to Allis Rubber Corp., a wholly owned subsidiary.

—o—

**R. V. Mfg. Corp.,** maker of hydraulic jacks, has moved from Lockport, N. Y., to a larger plant at Arcade, N. Y.

—o—

**Morrison Steel Products Inc.,** Buffalo, manufacturer of auto stampings, announces that its expansion program will cost about $500,000. An addition now under way will add 45,000 sq ft of floor area to its plant. Another addition is scheduled for next year.

—o—

**Eastman Kodak Co.,** Rochester, N. Y., has purchased the Kodak Optical Works machine shop building from WAA for $175,000. The one-story plant has 35,000 sq ft of floor area.

—o—

**National Supply Co.,** Pittsburgh, announces that its Superior Engine Division at Springfield, O., has plans under way for observance in 1948 of its 60th anniversary. The division makes diesel and gas engines.

—o—

**Carboloy Co. Inc.,** Detroit, manufacturer of tools and abrasives, has appointed Wiley-Hughes Supply Co. Inc., Trenton, N. J., as its distributor in central New Jersey.

—o—

**American Well Works,** Aurora, Ill., pump manufacturer, has acquired Anbar Foundry, Chicago, producer of brass and aluminum castings, and will operate it as the Anbar Foundry Division.

—o—

**General Electric Co.,** Schenectady, N. Y., has begun construction at its Pittsfield, Mass., Works of a million-dollar high voltage laboratory. When used with existing G-E facilities, it will create the world's largest man-made lighting center.

—o—

**American Stove Co.,** St. Louis, manufacturer of gas ranges and oil, gasoline and coal stoves, held an open house recently at its Harvey, Ill., factory with an attendance of 1200.

—o—

**Nopco Chemical Co.,** Harrison, N. J., recently honored 18 employees who have completed 15 years' service with the company. Nopco now has 119 employees with at least 15 years' longevity, or over 10 per cent of the total number of employees.

# The Business Trend

## Industrial Pace Nearly Equals Postwar Peak

INDUSTRIAL activity showed additional strength in the week ended June 21, with a result STEEL's industrial production index rose one point to 163 per cent of the 1936-1939 average, just one point below the postwar peak established in March.

However, the high production pace is now due to feel effects of summer vacations which this year will be widespread in industry. This summer many industrial plants are closing for the vacation period, with the belief the year's aggregate production will be disrupted less by such a plan than by a program of staggered vacations under which a plant is without some of its key employees all summer long. In addition, the closing of a plant for a vacation period provides opportunity to rebuild and balance stocks of materials and components.

**AUTOS**—An important factor in the currently high industrial production pace is automobile output, which in the week ended June 21 reached an estimated 103,278 passenger cars, trucks and busses and marked the first time since the week ended May 3 that the 100,000 mark has been exceeded.

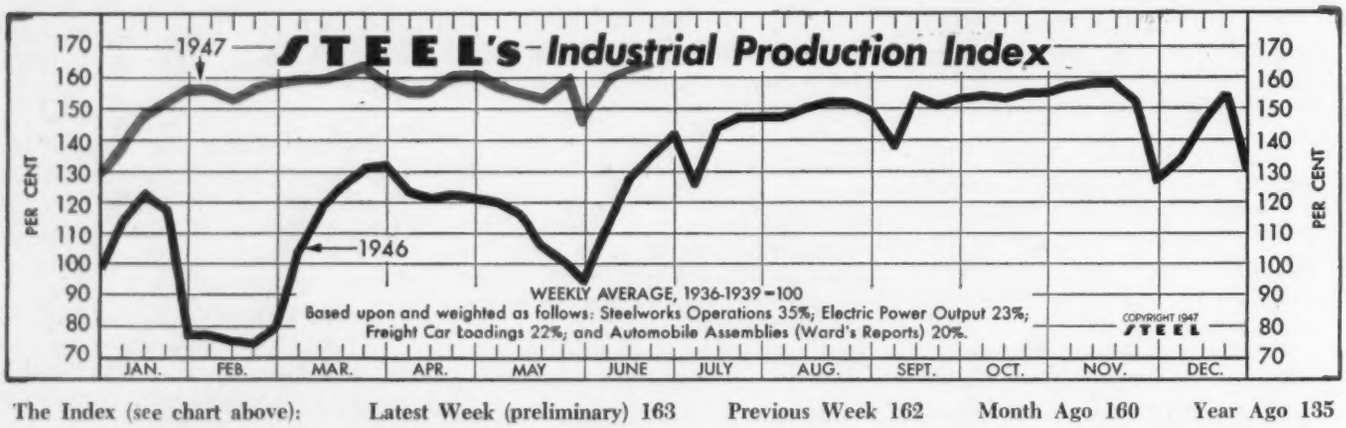
**STEEL**—Pressure for finished steel, particularly flat-rolled products, is holding ingot production at a steady and high level. For the past month the rate has been 96.5 per cent of capacity, and in all but the first week of 1947 it has been at or above 90 per cent.

**COAL**—Bituminous coal production this year through June 14 aggregated 37.4 per cent more than that for the corresponding period of last year but this lead is due to be cut down by work stoppages attending the cessation of government operation of the mines June 30 and the consideration of a new contract with the miners.

**PRICES**—After rising for two consecutive weeks, the wholesale price index of the U. S. Bureau of Labor Statistics receded slightly in the week ended June 14 to 147.6 per cent of the 1926 average. In the preceding week it had been 147.9 per cent.

**CONSTRUCTION**—Stimulated by a heavy volume of contracts for projects classified as publicly owned, construction awards in the 37 states east of the Rocky mountains totaled $742,837,000 in May, 23 per cent over April of this year but 22 per cent under May, 1946, F. W. Dodge Corp., New York, reported. Publicly owned projects had a contract valuation of $302,053,000, or 41 per cent of the total of all contracts let in May.

**BUSINESS FAILURES**—Return of competitive conditions to the nation's economy is increasing the rate of business failures. On the upgrade since last November, business failures in May reached 378, highest for any one month since March, 1943, Dun & Bradstreet Inc. reported. This boosted the rate of failures per 10,000 concerns in business from 12.4 in April to 17.3 in May. Nearly half the May failures were in the $5000 to $25,000 liability size group. Of the 378 failures, 155, or 40 per cent, were manufacturing concerns.




The Index (see chart above): Latest Week (preliminary) 163 Previous Week 162 Month Ago 160 Year Ago 135

## FIGURES THIS WEEK

| INDUSTRY | Latest Period* | Prior Week | Month Ago | Year Ago |
|---|---|---|---|---|
| Steel Ingot Output (per cent of capacity)† | 96.5 | 96.5 | 96.5 | 55.0 |
| Electric Power Distributed (million kilowatt hours) | 4,676 | 4,702 | 4,663 | 4,129 |
| Bituminous Coal Production (daily av.—1000 tons) | 2,146 | 2,250 | 2,162 | 2,061 |
| Petroleum Production (daily av.—1000 bbl.) | 5,114 | 5,113 | 5,025 | 4,949 |
| Construction Volume (ENR—Unit $1,000,000) | $94.5 | $158.1 | $113.2 | $105.8 |
| Automobile and Truck Output (Ward's—number units) | 103,278 | 97,943 | 96,651 | 54,475 |

* Dates on request. †1947 weekly capacity is 1,749,928 net tons, 1946 weekly capacity was 1,762,381 net tons.

| TRADE | | | | |
|---|---|---|---|---|
| Freight Carloadings (unit—1000 cars) | 900† | 895 | 891 | 858 |
| Business Failures (Dun & Bradstreet, number) | 70 | 66 | 102 | 25 |
| Money in Circulation (in millions of dollars)‡ | $28,195 | $28,253 | $28,116 | $28,116 |
| Department Store Sales (change from like wk. a yr. ago)‡ | +6% | +7% | +11% | +37% |

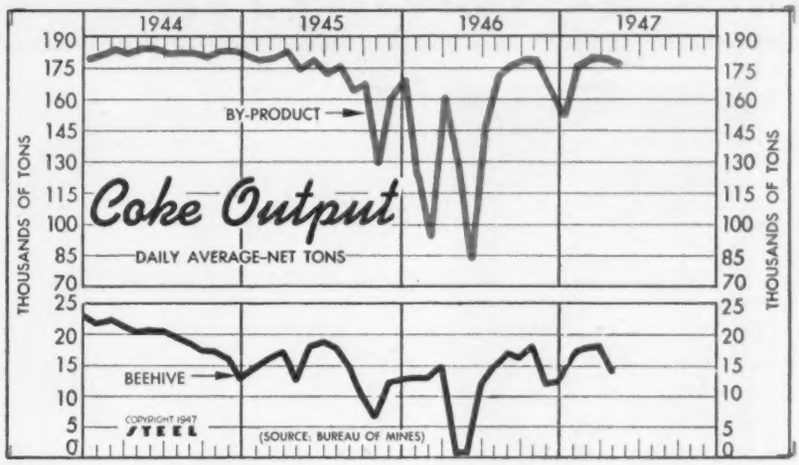
† Preliminary. ‡ Federal Reserve Board.

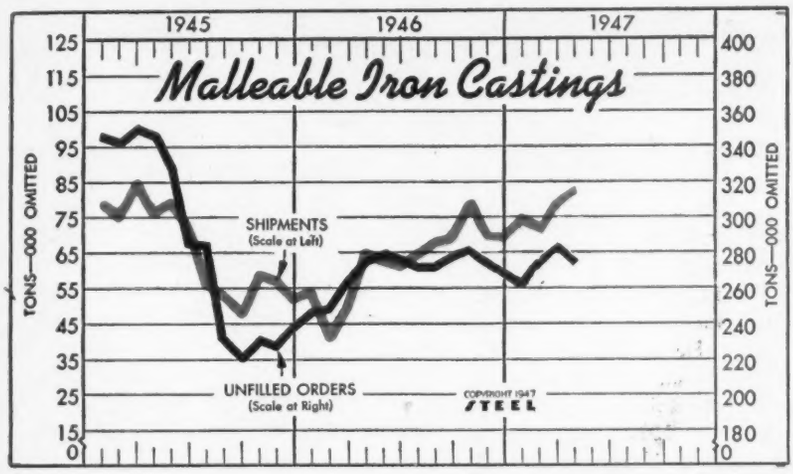
### Coke Output

**Bureau of Mines**

**(Daily Average—Net Tons)**

| | By-Product | | Beehive | |
|---|---|---|---|---|
| | 1947 | 1946 | 1947 | 1946 |
| Jan. | 181,245 | 122,570 | 18,124 | 13,093 |
| Feb. | 183,189 | 93,985 | 18,372 | 13,140 |
| Mar. | 182,529 | 161,290 | 18,725 | 14,962 |
| Apr. | 179,428 | 128,394 | 14,249 | 713 |
| May | ..... | ..... | ..... | 869 |
| June | ..... | ..... | ..... | 12,218 |
| July | ..... | ..... | ..... | 15,105 |
| Aug. | ..... | ..... | ..... | 16,892 |
| Sept. | ..... | ..... | ..... | 16,167 |
| Oct. | ..... | ..... | ..... | 17,954 |
| Nov. | ..... | ..... | ..... | 12,028 |
| Dec. | ..... | ..... | ..... | 12,302 |
| Ave. | ..... | 146,877 | ..... | 11,991 |



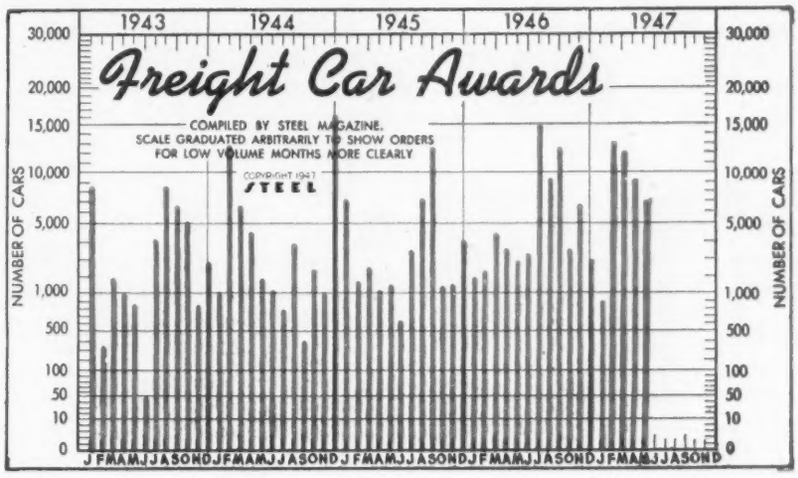

### Malleable Iron Castings

| | Shipments (000 omitted) | | Unfilled orders for castings for sale (000 omitted) | |
|---|---|---|---|---|
| | 1947 | 1946 | 1947 | 1946 |
| Jan. | 75.9 | 54.0 | 260 | 246 |
| Feb. | 74.7 | 40.2 | 274 | 249 |
| Mar. | 76.6 | 50.2 | 281 | 263 |
| Apr. | 81.9 | 65.0 | 275 | 268 |
| May | ... | 62.6 | ... | 272 |
| June | ... | 61.6 | ... | 276 |
| July | ... | 64.4 | ... | 272 |
| Aug. | ... | 67.9 | ... | 273 |
| Sept. | ... | 69.5 | ... | 277 |
| Oct. | ... | 79.2 | ... | 281 |
| Nov. | ... | 69.0 | ... | 278 |
| Dec. | ... | 68.3 | ... | 268 |

### Freight Car Awards

| | °1947 | °1946 | 1945 | 1944 | 1943 |
|---|---|---|---|---|---|
| Jan. | 9,172 | 1,500 | 7,200 | 1,020 | 8,365 |
| Feb. | 13,727 | 2,403 | 1,750 | 13,240 | 350 |
| Mar. | 12,049 | 4,512 | 2,500 | 6,510 | 1,935 |
| Apr. | 8,836 | 3,764 | 1,120 | 4,519 | 1,000 |
| May | 7,390 | 3,025 | 1,526 | 1,952 | 870 |
| June | ..... | 3,335 | 670 | 1,150 | 50 |
| July | ..... | 14,836 | 3,500 | 795 | 4,190 |
| Aug. | ..... | 9,629 | 7,240 | 3,900 | 8,747 |
| Sept. | ..... | 12,768 | 12,840 | 400 | 6,820 |
| Oct. | ..... | 3,407 | 1,320 | 2,425 | 5,258 |
| Nov. | ..... | 6,707 | 1,650 | 1,065 | 870 |
| Dec. | ..... | 3,041 | 4,116 | 16,245 | 2,919 |
| Total | ..... | 68,927 | 45,432 | 53,221 | 41,374 |

° American Railway Car Institute.


1943
1944
1945
1946
1947
Freight Car Awards
COMPILED BY STEEL MAGAZINE.
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS
FOR LOW VOLUME MONTHS MORE CLEARLY
COPYRIGHT 1947 STEEL
NUMBER OF CARS
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## FINANCE

| | Latest Period° | Prior Week | Month Ago | Year Ago |
|---|---|---|---|---|
| Bank Clearings (Dun & Bradstreet—millions) | $13,167 | $12,773 | $12,476 | $13,997 |
| Federal Gross Debt (billions) | $257.4 | $257.4 | $257.7 | $269.3 |
| Bond Volume, NYSE (millions) | $18.4 | $15.6 | $22.9 | $21.4 |
| Stocks Sales, NYSE (thousands) | 4,711 | 4,560 | 5,657 | 5,834 |
| Loans and Investments (billions)† | $54.7 | $54.6 | $55.0 | $61.7 |
| United States Gov't. Obligations Held (millions)† | $34,171 | $33,843 | $34,506 | $43,437 |

† Member banks, Federal Reserve System.

## PRICES

| | | | | |
|---|---|---|---|---|
| STEEL's composite finished steel price average | $69.82 | $69.82 | $69.82 | $64.45 |
| All Commodities† | 147.6 | 147.9 | 147.0 | 111.8 |
| Industrial Raw Materials† | 161.2 | 161.8 | 160.2 | 125.8 |
| Manufactured Products† | 142.9 | 142.9 | 142.2 | 106.8 |

† Bureau of Labor Statistics Index, 1926 = 100.

# Men of Industry

J. B. NEIMAN

W. C. SNYDER JR.

WALTER BONSACK

**J. B. Neiman,** general manager of the aluminum departments of Federated Metals Division, American Smelting & Refining Co., New York, has been re-elected president of the Aluminum Research Institute.

—o—

**Robert C. Becherer** has been appointed plant manager of the Ewart plant in Indianapolis of Link-Belt Co., Chicago. **Warren H. Maxwell,** formerly superintendent of the positive drive shop of the plant, has been appointed general superintendent. **S. L. Houck** has been named assistant general superintendent of the plant, and **Carl O. Schopp** has been appointed superintendent of the Ewart plant foundry.

—o—

**John R. Johnston** has been appointed assistant general manager of sales, Carnegie-Illinois Steel Corp., Pittsburgh. He formerly had been manager of sales in the Milwaukee district office, and is succeeded there by **Charles E. McIntyre,** who was formerly assistant manager of sales in the Detroit district sales office.

—o—

**R. C. Jayne** has resigned as vice president and general manager of Atlas Steels Ltd., Welland, Ont., and as a member of the board of directors and executive committee. He had been associated with the company since 1932, and previously had been connected with the Jessop Steel Co., Washington, Pa., and the Crucible Steel Co. of America, at Pittsburgh.

—o—

**Morris S. Evans,** recently district manager of the Buffalo plant of the American Car & Foundry Co., New York, has been appointed manager of the Estimating Division, with headquarters in New York.

—o—

**Alfred W. Schultz** has been appointed director of production and planning control of the Warren City Mfg. Co., Warren, O.

—o—

**W. C. Snyder Jr.** has been elected a vice president in the Engineering & Construction Divisions of Koppers Co. Inc., Pittsburgh. He succeeds **John F. Byrne,** vice president, who was killed May 30 in a commercial airplane crash in Maryland. From 1937 to 1945, Mr. Snyder had been president and general manager of the Lewis Foundry Machine Division of the Blaw Knox Co., Pittsburgh. He also was a vice president and member of the board of the Blaw Knox Co. In 1945 he became president and general manager of the Continental Foundry & Machine Co., East Chicago, Ind.

—o—

**Theodore E. Burke** has joined the Vanadium Corp. of America, New York, as sales engineer in the Railroad Division. He will have headquarters in Chicago. Mr. Burke had formerly been connected with the Youngstown Sheet & Tube Co., Youngstown, and with the Republic Steel Corp., Cleveland, as a contact metallurgist.

—o—

**Clifford M. Sayre** has been appointed general works manager, Sturtevant Division, Westinghouse Electric Corp., Pittsburgh. He will direct manufacturing operations at the division's plants at Hyde Park, Mass., Camden, N. J., La Salle, Ill., and Berkeley, Calif.

—o—

**Thomas Penfield** has been appointed market analyst of the Crosley Division, Avco Mfg. Corp., Cincinnati.

—o—

**Harry A. Norrie** has been appointed Buffalo branch manager of TelAutograph Corp., New York, and **Fred Trevorrow** has taken over the post of branch manager at Hartford, Conn.

—o—

**Walter Bonsack,** director of laboratories for National Smelting Co., Cleveland, has been named chairman of the Aluminum & Magnesium Division of the American Foundrymen's Association, Chicago. He is the present division secretary and also serves as head of the reclamation and alloying committee. Division vice chairman for the next two years will be **Manley E. Brooks,** Dow Chemical Co., Bay City, Mich. **J. C. DeHaven,** Battelle Memorial Institute, Columbus, O., has been elected secretary of the division.

—o—

**W. N. Springer** has been named purchasing agent for E. C. Atkins & Co., Indianapolis.

—o—

**Elis S. Hoglund** has been appointed assistant general manager of the Overseas Operations Division of General Motors Corp., Detroit. He had been a regional group executive with the division.

—o—

**Lorne F. Lavery** has been promoted by New Departure Division, General Motors Corp., Detroit, to manager of its Detroit office. **Charles D. McCall** has been appointed manager of automotive sales. Both have been sales engineers with the division.

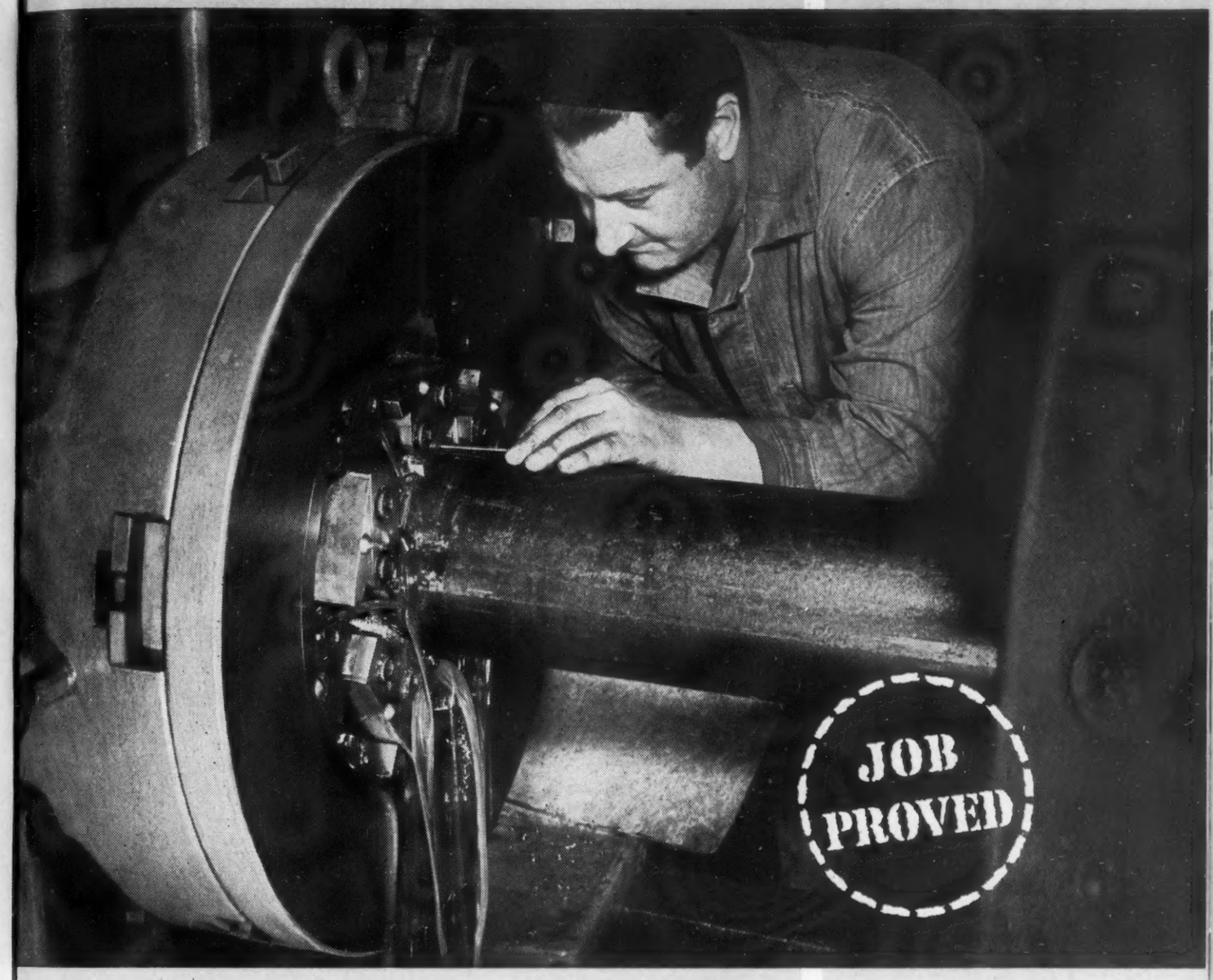
—o—

**William M. Adams** has been appointed to the executive staff of the Sprague Electric Co., North Adams, Mass., to be in charge of export activities. He was formerly associated with the United States Rubber Co., New York.

—o—

**Harold A. Hintz** has been appointed Pacific Coast sales manager for the H. K. Porter Co. Inc., Pittsburgh. He will

# Cutting Better Threads...Faster




## SUNICUT 196...

**Speeds Up Threading of Automatic Sprinkler Pipes, Improves Quality of Threads**

**Here is a case** where a big manufacturer of automatic fire-sprinkler systems increased production and improved his threads by replacing a special, expensive oil with Sunicut 196.

**Machine:** No. 5 Landis Pipe-Threading Machine.
**Operation:** Threading ⅜" to 8" Pipe. **Lubricant:** Sunicut 196.

**In this case, a saving of 15%** in oil costs resulted. This is a typical example of how Sun's "Job-Proved" cutting oils have aided in speeding up production and in reducing costs.

**Machine-tool operators prefer** Sunicut because it is a clear, transparent, free-flowing, sulphurized mineral oil. Sunicut is recommended for those exacting jobs where an emulsifiable cutting oil is not suitable.

**Other "Job-Proved" Sunicut grades** are suitable for use on automatic lathes, gear-cutters, etc. Contact the nearest Sun office for recommendations.

**SUN OIL COMPANY** · ***Philadelphia 3, Pa.***
*In Canada:* Sun Oil Company, Ltd.—Toronto and Montreal

**SUN**
**SUNOCO**
**INDUSTRIAL PRODUCTS**

have headquarters in Los Angeles. **J. F. Morley** has been appointed district sales engineer, San Francisco.

—o—

**Alton A. Way** has been appointed acting manager of the Tonawanda, N. Y., plant of the Chevrolet Motor Division, General Motors Corp., Detroit. He will serve during the absence of **Alfred G. Gulliver,** who is on sick leave.

—o—

**R. C. Hudson,** H. D. Hudson Mfg. Co., Chicago, has been elected president of the National Sprayer & Duster Association. **Harold F. Brandt,** Dobbins Mfg. Co., Elkhart, Ind., has been elected vice president. **G. H. Collier,** Elkhart, Ind., retires as president.

—o—

**E. G. Bailey** has been elected 1947-48 president of the American Society of Mechanical Engineers. He is vice president of the Babcock & Wilcox Co., New York.

—o—

**Richard H. Oberholtzer** has been appointed as a representative in the Detroit area for Kennametal Inc., Latrobe, Pa. **Charles H. Bodner** has been appointed tool engineer and representative in the Los Angeles area, and **John H. Wright** a representative in the New England district.

—o—

**Dr. Wilbur A. Lazier,** director of the Southern Research Institute, Birmingham, has been elected chairman of the Alabama Section, American Chemical Society, for 1947-48. He succeeds **Dr. Russel L. Jenkins,** Monsanto Chemical Co., St. Louis.

—o—

**Frank A. Newcombe,** manager of parts manufacturing for the Lamp Division at Bloomfield, N. J., of the Westinghouse Electric Corp., Pittsburgh, has been appointed manager of the incandescent lamp plant which the company will build in Little Rock, Ark. **Hans N. Horst,** assistant superintendent of the Fairmont, W. Va., Works of the division, has been named assistant manager of the new plant.

—o—

**Joseph E. Bayne** has been named general sales manager of the Lincoln-Mercury Division of the Ford Motor Co., Dearborn, Mich. He has been general sales manager of the Plymouth Division of the Chrysler Corp., Detroit. **A. H. Crowley** and **Hugh F. Charlesworth** have been named assistant sales managers of the Lincoln-Mercury Division, and **Richard E. Roberts** has been appointed director of the newly-created management relations department.

—o—

**Algot J. E. Larson** has been re-elected president and general manager of the Art Metal Construction Co., Jamestown, N. Y. **Warren W. Cunningham** has been named chairman of the board.

—o—

**J. F. MacEnulty** has retired as chairman of the board of directors of Pressed Steel Car Co. Inc., Pittsburgh. He has been associated with the company for 48 years, joining it a month after it was organized in 1899. Mr. MacEnulty will continue to be available to the company on a consultative basis.

—o—

**D. C. Cameron,** open hearth superintendent, Kaiser Steel Corp., Fontana, Calif., has been elected president of the newly organized Southern California Chapter of the American Institute of Mining & Metallurgical Engineers.

—o—

**Joseph M. Weldon** has been appointed assistant to the vice president of International Nickel Co. Inc., New York. He has been head of the Aeronautical Division of the nickel alloys sales department of the company.

—o—

**Fred J. Schreiber** has joined the sales organization of the Universal Steel Co., Cleveland. He has had previous connections with the Cleveland district sales office of Republic Steel Corp., and with the Ohio Pipe & Supply Co. Inc., Cleveland.

—o—

**Joseph J. Duffy Jr.** has been appointed manager of sales, Special Chemicals Division, Pennsylvania Salt Mfg. Co., Philadelphia. He succeeds **William P. Drake,** recently appointed assistant vice president.

—o—

**Fred W. Sparks** has joined the Buda Co., Harvey, Ill., as a district representative in the Engine Division. He will handle the Ohio Territory. He had formerly been with the Euclid Road Machinery Co., Cleveland.

—o—

**A. J. Darlson** has been named to head the newly opened Atlanta sub-district office of the Edison Storage Battery Division, West Orange, N. J., of Thomas A. Edison Inc.

—o—

**F. L. Ebersole,** formerly mechanical engineer, American Rolling Mill Co., Middletown, O., has joined Loewy Construction Co. Inc., New York, as assistant chief engineer of the Rolling Mill Division.

—o—

**A. B. Gibson,** founder and president of the Gibson Electric Co., Pittsburgh, has been awarded the honorary degree of Doctor of Engineering by the Clarkson College of Technology, Potsdam, N. Y.

—o—

**Harry Saxer,** general superintendent of the Aliquippa Works, Jones & Laughlin Steel Corp., Pittsburgh, has retired after serving more than 47 years in the steel industry—more than 40 of them with Jones & Laughlin.

—o—

**Ralph T. Brengle,** Potter & Brumfield Sales Co., Chicago, has been elected president of the National Association of Relay Manufacturers, recently organized in Chicago. Other officers elected are: **C. P. Clare,** C. P. Clare & Co., Chicago, vice president; and **J. J. Rowell,** Guardian Electric Mfg. Co., Chicago, secretary-treasurer.

—o—

**Francis E. Murphy** and **Henry G. Meyer** have been appointed assistant production managers of the Pennsylvania Salt Mfg. Co., Philadelphia. Mr. Murphy was formerly director of development at the company's Whitemarsh Research La-

JOSEPH J. DUFFY Jr.

RALPH T. BRENGLE

# Nothing Succeeds Like Success

INTERSTATE ENGINEERING CORPORATION

EASY AMERICA'S LEADING WASHER-IRONER

Servel GAS REFRIGERATOR

Packard

REYNOLDS ALUMINUM

WORTHINGTON

KAISER

FRAZER

Seeger

Barcalo

FTE

WARNER ELECTRIC BRAKES

Vickers

DOEHLER METAL

SQUARE D
SQUARE D COMPANY
ELECTRICAL EQUIPMENT

OHIO NUT AND WASHER CO.

JOHN DEERE
QUALITY FARM EQUIPMENT

DURABILT MFG. CO.

ROCK-OLA

ELECTROLINE MANUFACTURING COMPANY

Warco PRESSES

TOOLS

WESTINGHOUSE

(REG. U. S. PAT. OFF.)

Electresteem

WARREN CITY MANUFACTURING COMPANY

467 Griswold Street, Warren, Ohio

*A subsidiary of The Federal Machine and Welder Company*

*Offices in Principal Cities*

boratories, and Mr. Meyer was assistant to the production manager of the company.

—o—

**Howard C. Wick** has been appointed a director of the American Car & Foundry Co., New York. He has been secretary of the company since 1916.

—o—

**R. C. Fuller** has been named general manager of the Pacific Division of Bendix Aviation Corp., Detroit.

—o—

**R. D. Moody** has been appointed manager of the San Francisco district office of Allis-Chalmers Mfg. Co., Milwaukee. He succeeds **F. Harvey Searight.**

—o—

**Joseph B. Cary** has been elected executive vice president of Food Machinery Corp., San Jose, Calif. He formerly had been president of the company's Niagara Chemical Division and vice president of the corporation. He is a director of the company. **Ernest Hart** has been named manager of the Niagara division and has also been made a vice president of the company.

—o—

The following men have been appointed to the staff of application engineers of Kennametal Inc., Latrobe, Pa.: **Hugh A. Pilling,** who will work out of the Philadelphia office; **Frank E. Ryan Jr.,** New England headquarters; **Wm. Dalton Huston** and **D. C. Cunningham,** Detroit office. **Gilbert A. Bunn,** formerly a representative, has been appointed manager of the Philadelphia district. **Walter C. Lavers** and **Joseph F. Liebscher,** both formerly application engineers, will now serve as representatives, and will work out of the Kennametal office at Los Angeles. **Ralph L. Miller** has joined the company as a representative in the Reading, Pa., area.

—o—

**Richard B. Carland** has been appointed sales promotion manager of the wire and cable department of United States Rubber Co., New York. He will have headquarters in the company's general office in New York.

—o—

**Arthur W. Gittins,** recently works manager of the Midland, Pa., plant of the Crucible Steel Co. of America, New York, has been appointed special lecturer in the metallurgical engineering department of the University of Pittsburgh.

—o—

**George McClennen,** Delta Equipment Co., Philadelphia, has been elected president of the Machinery Dealers' National Association. He succeeds **Harvey H. Goldman,** Harvey Goldman & Co., Detroit. Other officers elected are: **Ralph Hochman,** Ralph Hochman & Co., Newark, N. J., first vice president; **Joseph T. Weiss,** Interstate Machinery Co., Chicago, second vice president; and **Charles Simmons Sr.,** Simmons Machine Tool Corp., Albany, N. Y., treasurer. **Randolph K. Vinson,** Chicago, is executive director.

—o—

The Babcock & Wilcox Co., New York, has announced the following administrative changes for its Barberton, O., works: **G. J. Hartnett Jr.** has been appointed superintendent of planning, and **M. Nielsen** has been named superintendent of production.

—o—

**Dr. R. M. Zabel** has been appointed to the executive engineering staff of the Lamp Division of the Westinghouse Electric Corp., Pittsburgh.

—o—

**O. A. Schilling** has been named eastern sales manager of the Mechanical Goods Division, Goodyear Tire & Rubber Co., Akron. He has been serving as district manager of mechanical goods at Dallas, Tex. He will make his headquarters in Akron.

—o—

**Tully H. Turney** has been appointed acting advertising manager of the Glidden Co., Cleveland. **Frank Gerlak,** assistant in the advertising department, has been promoted to assistant advertising manager.

—o—

**C. A. Fegtly** has been appointed manager, and **F. W. De Koltz,** sales manager, the Pacific Coast Division of Pittsburgh-Des Moines Steel Co., Pittsburgh. Their headquarters will be at the company's new fabricating plant, Santa Clara, Calif.

—o—

**B. A. TePaske** has been named vice president in charge of sales, Farm Equipment Division, Graham-Paige Motors Corp., Detroit. He had been assistant sales manager of the division.

—o—

**E. C. Koster,** vice president and general manager of the Vlchek Tool Co., Cleveland, has been elected president and general manager of the organization to succeed the late **F. J. Vlchek,** founder of the firm. **Henry F. Vlchek** has been elected vice president. He formerly had been treasurer of the company. He is succeeded in that position by **Donald B. Wilson,** who also continues as secretary.

—o—

**N. H. Callard** has been appointed manager of rural electrification, industry sales departments, Westinghouse Electric Corp., Pittsburgh. He will be responsible for development plans and coordination of sales efforts pertaining to the farm and rural market of the industry sales departments and the Manufacturing Divisions.

—o—

**T. Keith Glennan,** formerly an executive of Ansco Division, General Aniline & Film Corp., Binghamton, N. Y., and wartime director of the U. S. Navy Underwater Sound Laboratory, has been elected president of Case Institute of Technology. He succeeds **Dr. William E. Wickenden,** who retires in September after 18 years of service.

—o—

**Fred K. Schroeder** has been named purchasing agent for foundry products and supplies at the West Allis works of the Allis-Chalmers Mfg. Co., Milwaukee. **J. J. Nimtz** has been named purchasing agent for steel and mill products for the works. **C. W. Berger,** former purchasing agent for steel products, has resigned to engage in an enterprise of his own.

—o—

**Stewart Roberts** has been appointed director of advertising and sales promotion for Bendix Home Appliances Inc., South Bend, Ind.

—o—

**Edward L. Keenan** has been elected president and general manager of Glenn M. Rogers Inc., Buffalo. He formerly had been vice president and general manager of the Farnham Mfg. Co., Buffalo.

—o—

**E. K. Miller** has been appointed general superintendent of the Aliquippa Works, Jones & Laughlin Steel Corp., Pittsburgh. He succeeds **Harry Saxer,** who has retired.

—o—

**Dr. William E. Good,** physicist, Westinghouse Electric Corp., Pittsburgh, has

ROBERT B. SWOPE

*President and general manager, Southern Oxygen Co. Inc., Washington, has been elected president, International Acetylene Association. Noted in STEEL, June 23 issue, p. 94*

W. FOSH DEW

*Appointed sales manager of Clearing Machine Corp., Chicago. Noted in STEEL, June 23 issue, p. 94*

HARRY DOBRIN

*Has been named president of Furnace Engineers Inc., Pittsburgh. Noted in STEEL, June 23 issue, p. 97*

DOUGLAS M. LYON

*Appointed sales manager, Porter-Cable Machine Co., Syracuse, N. Y. Noted in STEEL, June 23 issue, p. 94*

been granted a year's leave of absence from the research laboratories to aid in atomic energy investigation at the Argonne National Laboratory near Chicago.

—o—

**John J. Davis Jr.,** manager of railroad material sales, Carnegie-Illinois Steel Co., subsidiary of the U. S. Steel Corp., New York, has joined the Railroad Division of Inland Steel Co., Chicago. In January, 1948, he will become manager of sales, Railroad Division, succeeding **William J. Hammond,** vice president, who will retire at that time.

—o—

The Electric Metal Makers Guild Inc. have elected the following officers for the coming year: President, **R. H. Frank,** Bonney-Floyd Co., Columbus, O.; vice president, **A. J. Scheid Jr.,** Columbia Tool Steel Co., Chicago Hts., Ill.; secretary-treasurer, **D. L. Clark,** Simonds Saw & Steel Co., Lockport, N. Y.

—o—

**Harry Oldham** has been appointed superintendent of the New Brunswick, N. J., foundry of Mack Trucks Inc. He will be in direct charge of the production of all the company's castings.

—o—

**John L. Griffith** has been appointed sales manager in the New England territory for the Federated Metals Division of the American Smelting & Refining Co., New York. He has been associated with the company for 17 years. He succeeds **Maxwell M. Levey,** who has resigned.

—o—

**George L. Nunn** has been appointed southern Connecticut sales engineer, Machinery Division, Austin-Hastings Co. Inc., Cambridge, Mass. He will operate from an office to be established in the New Haven district. **Ralph L. Hohnhorst** will continue to work from that office, but will now be able to spend his entire time in central and northern Connecticut.

—o—

**D. J. Neasham** is president of the Ottumwa Iron Works, Ottumwa, Iowa. He succeeded his father, **J. W. Neasham,** who died last September. **Ralph W. Jones** is vice president in charge of sales of the company.

—o—

**L. W. Stolte,** secretary and general credit manager, Fairbanks, Morse & Co., Chicago, has been elected to the board of directors of the Chicago Association of Credit Men.

## *OBITUARIES . . .*

**Leon F. Payne,** 63, treasurer of Carnegie-Illinois Steel Corp., Pittsburgh, subsidiary of United States Steel Corp., died June 22. He had been connected with the United States Steel Corp. in various positions for more than 35 years, and from 1929 to 1940 had been vice president and treasurer of the Oil Well Supply Co., a subsidiary of the corporation.

—o—

**F. G. Switzer,** 84, founder and former president of the Electro Chemical Engraving Co. Inc., New York, died June 22.

—o—

**W. J. Wahl,** 52, assistant superintendent of the Upson Bolt & Nut Division of the Republic Steel Corp., Cleveland, died June 22. He had been connected with the division for 37 years.

—o—

**Lee Showers,** 68, retired general superintendent of the window glass plants of Pittsburgh Plate Glass Co., Pittsburgh, died recently. He had been associated with the company since 1901.

—o—

**George F. Golby,** manager of Jessop Steel Co. Ltd., and the Ajax Distributing Co., Toronto, Ont., died recently.

—o—

**Reinhold G. von Kokeritz,** 81, founder and president of the Durabla Mfg. Co. and Canadian Durabla Ltd., Toronto, Ont., died recently.

—o—

**Henry L. Waterman,** formerly a part owner and treasurer of the Union Structural Steel Co., Syracuse, N. Y., died recently in that city.

—o—

**Harvey D. Symonds,** 72, engineer and contract manager, George A. Fuller Co., New York, died recently at Orange, N. J.

—o—

**Walter B. Weisenburger,** 59, executive vice president, National Association of Manufacturers, New York, died suddenly June 23 of a cerebral hemorrhage.

—o—

**William A. Kowalke,** 56, supervisor of construction and design, Union Carbide & Carbon Corp., New York, died recently. He had been connected with the organization for 30 years.

—o—

**Lorenzo B. Smith,** 61, for 37 years senior partner, Smith & Robinson Co., Chicago, died June 10.

—o—

**Walter E. Lucy,** 55, chief field accountant for the Stone & Webster Engineering Corp., Boston, died recently.

—o—

**Arthur F. Schefft,** 63, industrial supply salesman and former official of the Universal Valve & Fittings Co., Cleveland, died June 16.

—o—

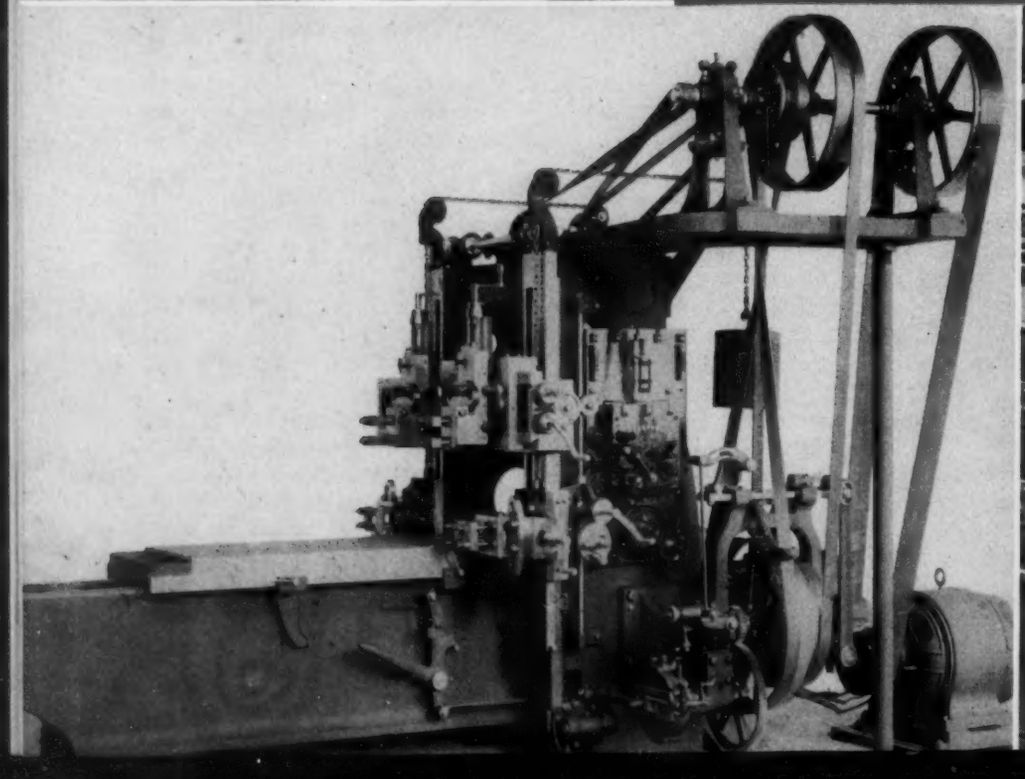
**Robert M. Gantert,** 52, industrial machinery manufacturer's agent, New York, died recently.

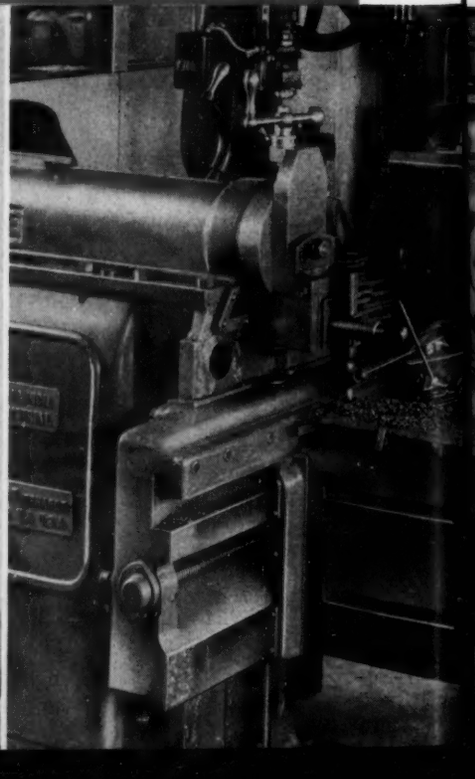
By GUY HUBBARD
*Machine Tool Editor, STEEL*

# SURFACE MACHINING...

Part Four of a Series, in Which Is Told Something of the Origin and Development of Planers and Shapers, and Their Importance Today as Basic Types of

## MODERN MACHINE TOOLS





LACKING the necessary imagination to think up a more clearly descriptive name for those machine shop operations carried on by metal planers, shapers and slotting machines, I am using the term "surface machining" to cover them. Had it been a smart choice of words, this explanation would not be necessary. However, let's get on with the story.

Machine tools often are characterized as "machines which make all machines—including themselves". Of no class is that statement more true than the planer family. Builders of machinery—including machine tools—are today inclined to take planers for granted. When a design involves long beds demanding straight, flat, parallel and smooth surfaces, they toss the problem over to the planer builder. He in turn has to design and build a planer approximately twice as long and at least as accurate as the big part to be planed.

What a surprise it would be to the customer if—instead of the planer—the planer manufacturer delivered to the customer a box containing carpenter's chalk and chalk line, hammers and cold chisels, a large assortment of files, some hand scrapers, a box of Prussian blue, a machinist's level and three rough castings for surface plates. Those were the tools and equipment used by the early machinery builders to produce true, flat metal surfaces. Those were the tools by which the first planers were produced.

At the basis of that handicraft lay the natural law which enables three surface plates, after laborious chipping and filing, to be "scraped together" with infinite patience to produce true planes which in turn can be used to check other laboriously chipped and filed and patiently scraped surfaces until they too become approximately true planes.

**Planers will be among the largest, most powerful "Master Tools of Industry" operating at the National Machine Tool Show, Chicago, September 17-26 1947.**

**Don't be dislead by their "single point tool" classication. 1947 model planers with four or more heads equipped with carbide tools, are capable of record production. That will be demonstrated during the Big Show.**

Is it surprising that the early steam engine builders racked their brains to devise "straight line motions" made up of pivoted links to avoid the use of slides? They had no planer manufacturers to whom they could toss those problems before the days of Spring of Aberdeen, Jeremy Bentham, Joseph Branah, Matthew Murray, James Fox, George Rennie, Joseph Clement and Richard Roberts, the Scottish and English engineers and machine tool builders whose basic planer developments took place between 1793 and 1820. In the 1830s, Joseph Clement's "great planer" was working night and day at the rate of $4.32 per square foot. It planed less than one square foot an hour—but even at that Mr. Clement was doing all right for those days. His virtual monopoly on large work continued for 10 years.

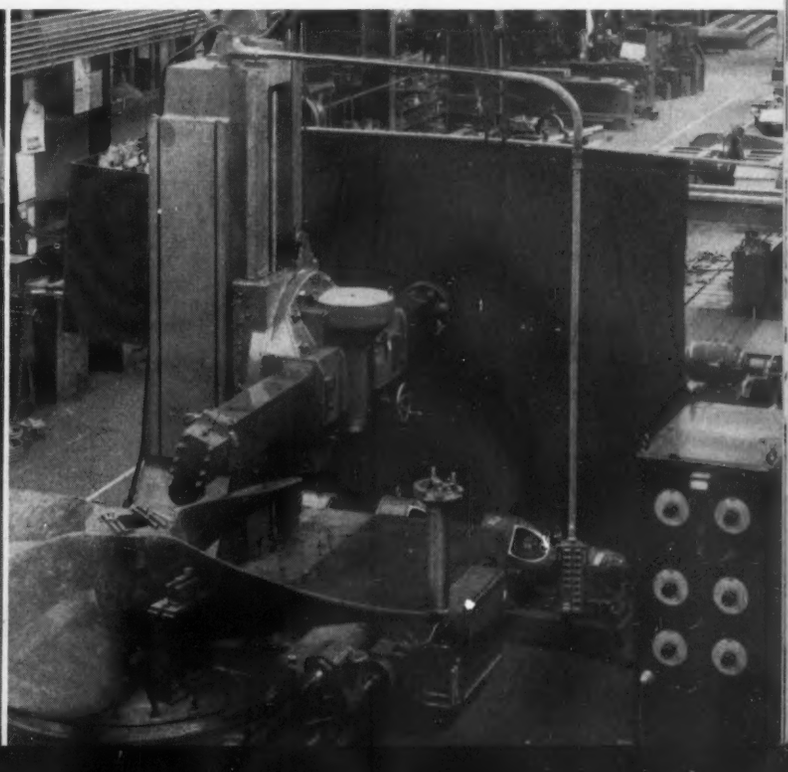
American machine tool builders came into the planer field in the 1820s with designs which probably were suggested to them by British (*Please turn to Page* 102)

*Upper left—Metal removing ability of modern heavy duty planer is demonstrated in machining slab of tough steel at the Warner & Swasey plant*

*Lower left—Pioneer project in machine tool electrification as carried out by the G. A. Gray Co., Cincinnati, on a heavy duty planer back in the early* 1900s

*Center—Battery of motor driven shapers with crank-type "quick return". Operating on tool work, they demonstrate convenience of supervision. Photo courtesy International Nickel Co.*

*Below—Draw cut shaper with variable voltage drive, built by Morton Mfg. Co., Muskegon, Mich., for generating curved surfaces on ship propellers. Photo courtesy Westinghouse Electric Corp.*

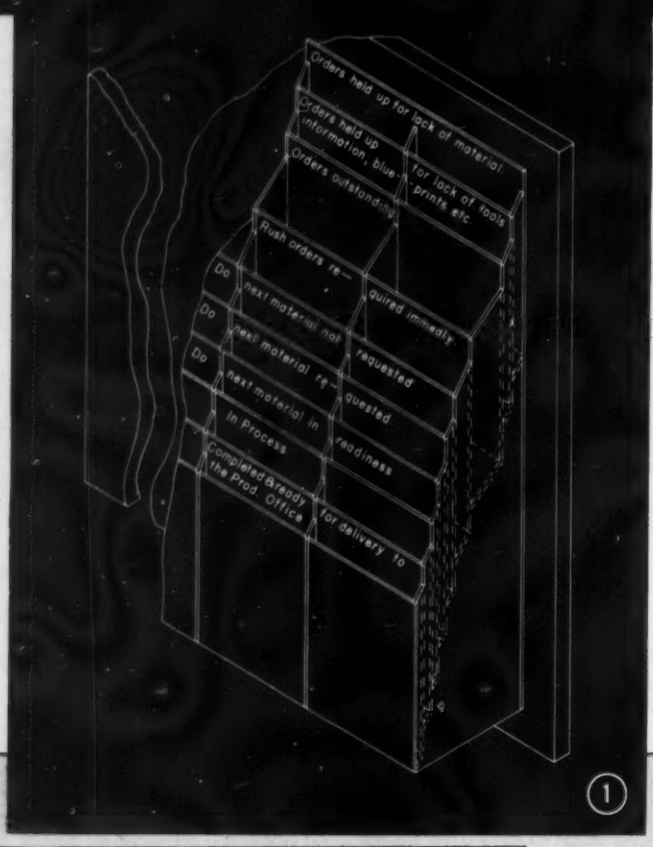


# Controlling

By JOHN T. LANCASTER
*Consulting Engineer*

NO system for controlling production and flow of parts can be recommended, without qualification, as "best" for all manufacturing plants. Each company has its own problems which must be carefully analyzed in the light of that particular shop's individual requirements, and the necessary controls set up to meet the needs.

Recognizing the gap that may exist between shop and production office, with regard to paperwork, here is a control program that is simple enough to be adopted with-


Orders held up for lack of material
Orders held up for lack of tools information, blue prints etc.
Orders outstanding
Rush orders re— quired immediately
Do next material not requested
Do next material re- quested
Do next material in readiness
In Process
Completed & ready for delivery to the Prod. Office
1

PRODUCTION CARD NO: 755
CUSTOMERS NAME

| SPECIAL ORDER NO: | MFG: ORDER NO: | PARTS REQUIRED |
|---|---|---|
| A 930 | 1005 | 2000 |

PART NO: 2 — 1
PART NAME: CONE A
DATE THIS CARD ISSUED: Nov. 5-/46
EMPLOYEE'S NAME
EMPLOYEE'S NO.
OPERATION
DATE
PTS. WKED.
TIME HRS MFS.
Remarks

REMARKS:
USE BATCH CARD. 207.
TURRET WORK

| BATCH LETTER | Batch number | Quantity this batch | Date parts finished |
|---|---|---|---|
| A | 1 | 2000 | Dec.20-/46 |
| B | | | |
| C | | | |
| D | | | |

This card to stay in the progress planning and control board, as work on batches is completed put back in proper section. When parts finished appxs. the parts required, send card to Production Office.

STANDARD PARTS MASTER CARD 2

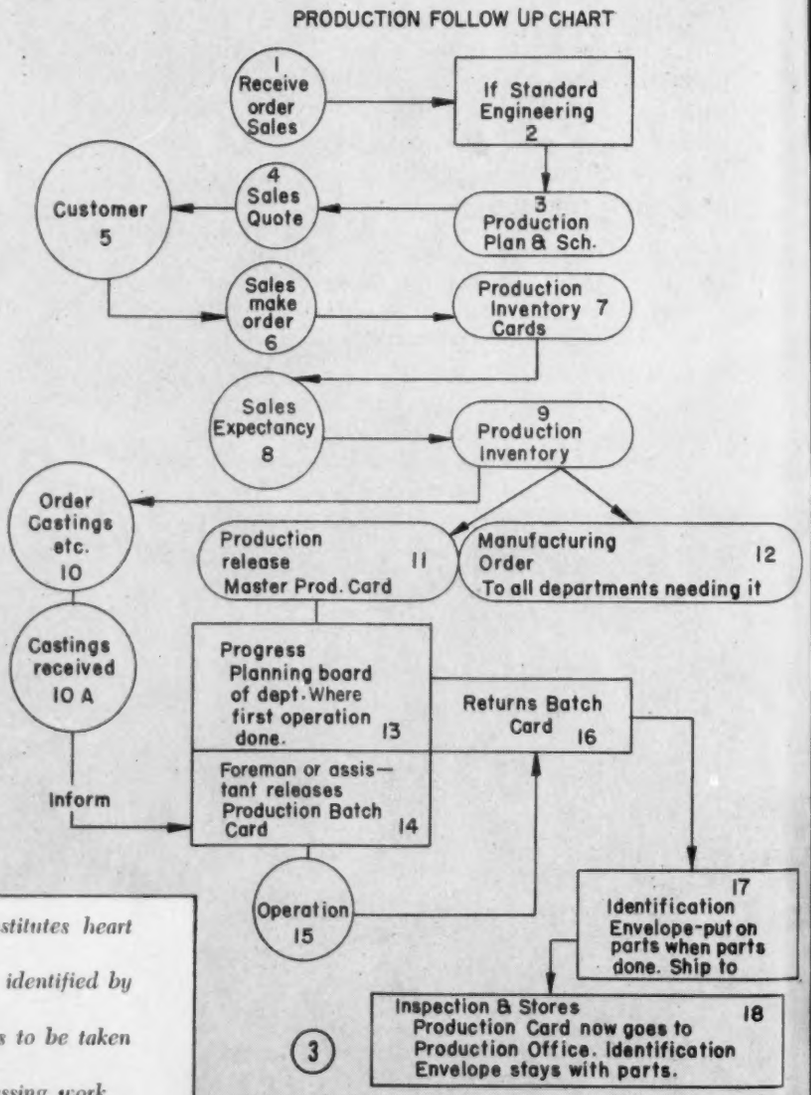

PRODUCTION FOLLOW UP CHART
1 Receive order Sales
If Standard Engineering 2
3 Production Plan & Sch.
4 Sales Quote
Customer 5
Sales make order 6
Production Inventory 7 Cards
Sales Expectancy 8
9 Production Inventory
Order Castings etc. 10
Production release 11 Master Prod. Card
Manufacturing Order 12 To all departments needing it
Castings received 10 A
Progress Planning board of dept. Where first operation done. 13
Returns Batch Card 16
Inform
Foreman or assis— tant releases Production Batch Card 14
Operation 15
17 Identification Envelope-put on parts when parts done. Ship to
Inspection & Stores 18 Production Card now goes to Production Office. Identification Envelope stays with parts.
3

*Fig. 1—Progress planning and control board constitutes heart of system*

*Fig. 2—Production cards are of four types, usually identified by different colors*

*Fig. 3—Production follow-up chart, showing actions to be taken by various departments*

*Fig. 4—Manufacturing order is authority for processing work*

*Fig. 5—Running inventory card for raw parts and finished pieces*

# Parts Flow

***One way to avoid last minute parts shortages and other unnecessary production delays is to adopt a well-planned system of control which requires a minimum of paperwork***

out involving the shop people in an undue amount of "pencil-pushing".

When an order is accepted, send it straight to the engineering department to decide whether standard parts are necessary or if new parts have to be designed. After ascertaining what is needed, send information on to the production planning department. If new work, complete blue prints and shipping list.

The production planning department will make out a production card, Fig. 2, showing operations which are to be performed on each machine. Production cards are of four types usually identified by different colors: Standard parts master card, branch batch card, special parts master card, special parts branch batch card.

The cards are then returned to engineering after the production department has ordered such steel, castings, forgings as are necessary. The engineering or production engineering departments design such dies, jigs or fixtures as may be needed. Instructions for making these are issued to the tool room via the production department.

If the work is standard, send it on to the running inventory section. Here the parts required are entered on the running inventory card, Fig. 5. If all items on card are filled in conscientiously it is easy to see at a glance how the stock stands.

These cards are continually being checked by the manufacturing order release section where manufacturing orders, Fig. 4, production (*Please turn to Page* 95)

## MANUFACTURING ORDER

USE PRINTS IN ALL CASES

| NAME OF PART | BEARING | PART No. | 2 |
|---|---|---|---|
| NUMBER OF THIS M.O. | OTHER REF. No. | QUANTITY | DATE THIS MO. ISSUED |
| 1005 | / | 1000 | NOV. 5-/46 |

| ITEM No. | PIECES | PART NAME | NUMBER STOCK | BALANCE MAKE | STEEL REQUIRED | PRINT No. | PROD: CARD No. | BATCH | ACT'LY FIN'D | DATE | COST MATERIAL | COST LABOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2000 | CORE A 1 11/32" | / | 2000 | 224 FEET 1 7/8" JALCASE" | | 755 | | | | | |
| 2 | 4000 | RACE B 23/32" | / | 4000 | 240 FEET 2 3/8" JALCASE" | | 755 | | | | | |
| 3 | 8000 | RIVET 1 1/4" | / | 8000 | 840 FEET 1/8" C.R.S. | | 757 | | | | | |
| 4 | 54,000 | 3/16 BALLS GRADE A | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | SHIP ONLY 1000 COMPLETE BEARINGS | | | FEB. 24-/47 | | | | | | | |
| | | | | | %A930 | | | | | | | |

| DEP'T No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MF'G: ORDER SENT TO | | | * | | | | | | | | | | | | | | | | | |
| MF'G: ORDER COMPLETED | | | Feb 24-/47 | | | | | | | | | | | | | | | | | |

4

| CASTING NUMBER | / | PRINT | — | NAME OF PART | PART NUMBER OR MATERIAL | 1 7/8 |
|---|---|---|---|---|---|---|
| FORGING NUMBER | / | OTHER NUMBER | — | Jalcase Round | | |
| DIE CAST: NUMBER | / | | | | | |

| Raw parts ordered: Pieces | Date | Pur: Or: | Raw parts received: Pieces | Date | Weight | Cost $ | ¢ | Ord: Custom: Pieces | Date | Quan: ord: Shop: Pieces | Date | P.C. No: | Finished by Shop: Pieces | Date | P.C. | Shipped: Pieces | Date | Balance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| feet | | | feet | | Lbs. | | | | | | | | | | | | | feet |
| 1000 | Sept 46 | 462 | 1000 | Dec. 46 | 9000 | | | 1000 | Aug 46 | 2000 | Nov. 46 | 755 | | | | | | 770 |
| | | | | | | | | feet | | feet | | | feet | | | | | |
| | | | | | | | | 112 | | 224 | | | 230 | | 755 | | | |

5

*In this second and concluding part of the series, the authors outline a general program for keeping the cost of owning and operating a lighting system at a minimum*

# How To Budget Industrial Lighting Costs —Planning Maintenance

By J. C. FORBES and J. L. TUGMAN
Engineering Division
Lamp Department, General Electric Co.
Nela Park, Cleveland

ONE of the past presidents of the Illuminating Engineering Society once wrote an article about "the real lighting expert".[1] The individual so identified was the man with soap and water who washed up dirty reflectors and replaced burned-out lamps. The point was good then, and is today. An originally well-designed system will perform efficiently only in proportion to the extent to which it is maintained.

It is axiomatic, therefore, that if there is to be more sense to industry's lighting dollar we must plan to keep the equipment in good shape. Poorly maintained reflectors and old or burned-out lamps reduce the illumination level and the supposed savings actually increase the unit cost of light delivered to the work area.

Planning the maintenance of a lighting system is as important as planning to have an adequate installation in the first place. Without planning for it, very little maintenance is done. Lamps do not operate forever and must be replaced, and the loss of light due to accumulated dust and dirt on lamps and reflectors may be in excess of 40 per cent.

In outlining a general program of planned lighting maintenance, some assumptions have to be made. Consideration has to be taken of the multitude of conditions special to a particular plant. Our plan, therefore, is arranged so that experience in any plant can indicate minor changes without loss of the essential features.

Three factors are recognized as basic to the development of the program. (Although fluorescent lamps are used throughout this discussion, the counsel given can be applied to other sources with some exceptions which are noted). 1. Collection of dirt and dust on equipment reduces light output. 2. Lamp burnouts must be replaced. 3. Lighting equipment must be accessible to be maintained.

It must be recognized that dust and dirt will collect on lighting equipment much more rapidly during the first few months of operation, either when it is new or after it has been cleaned. The rate of dirt depreciation will vary with the various communities in which the plants are located, as well as with the type of product and conditions in the individual buildings within any one plant. Observations indicate that if the lighting equipment is allowed to remain untouched for an indefinite period, it would finally reach a point at which it would not further reduce the light output.

For example, for one particular set of conditions the point of equilibrium might be about 52 per cent of initial output; that is, the most that lighting equipment would depreciate due to dust and dirt would be 48 per cent. This figure will vary with type of equipment and the atmosphere in different plants. For purpose of illustration let us assume that depreciation would average approximately 4 per cent per month for the first 4 to 6 months, and then gradually decrease in successive months until the maximum depreciation is reached.

*Fig. 6 — Installation at National Aluminum & Bronze Co., Cleveland, provides 35 footcandles with 3000-w mercury units which serve 1400 sq ft of floor space per unit. Units are mounted 40 ft above floor on disconnecting hangers which facilitate cleaning*

*Fig. 7—Maintenance man on safety ladder relamps fixture*

*Fig. 8—Close-up of disconnecting hanger used in installation shown in Fig. 6*

*Fig. 9—Portable maintenance platform designed so two men can work on two rows of fixtures. Platform can straddle machinery between rows*

Cleaning of reflectors and lamps is the heart of "planned lighting maintenance"[2]. It can be shown that even for high labor rates, it is economical to clean fixtures more frequently than is commonly done. The most economical frequency of cleaning can be established for any installation by consideration of three items:

A. Annual cost of owning and operating the lighting system
B. Rate of depreciation due to dirt collection on units
C. Cost of cleaning.

A—To indicate how to find the annual cost of owning and operating a lighting system, the following analysis has been made for two industrial type reflectors employing four 40-w fluorescent lamps. This method can, of course, be adapted to any type of reflector and set of operating conditions.

**Installation Cost per Outlet:** The annual cost per outlet depends upon a given "write off" of the first cost, the cost of energy, and the cost of lamp replacement, including labor cost.

| | | |
|---|---|---|
| Installation Cost per Outlet | | $42.50 |
| Annual owning cost at 16-2/3 per cent per year | | 7.10 |
| Lamp replacement cost (4000 hours annual operation) (lamps replaced once a year) | | |
| Lamp cost 30 per cent discount (4 x $1.00 x 70 per cent) | 2.80 | |
| Labor to replace | .80 | |
| | | 3.60 |
| Annual energy cost at 1c kwh (191 w x 4000 hours) | | 7.60 |
| Annual cost per outlet | | $18.30 |

This is cost of operating outlet 4000 hours regardless of quantity of light received, excluding cost of cleaning.

B—In order to determine the rate of depreciation due to dirt collection on any particular type of luminaire, a simple test may be made in three steps right in the area in which they are located. 1—Clean all units and start with relatively new lamps so replacement will not be necessary during test. 2—After a specified time has elapsed, preferably 4 months, or at least 2 months, make footcandle readings in the test area. 3—Clean the reflectors and lamps again, and with the same lamps installed, make a second set of footcandle readings, using same locations.

Difference between the before and after footcandle readings (steps 2 and 3) will give the amount of light that is being lost through the dirt that collected on the fixtures and the lamps. This can be expressed in per cent of total light that is available as determined in step 3. Divide the per cent of light lost by the number of months elapsed between the time the test was started and when it was completed, to obtain rate of depreciation per month.

In one industrial plant where a test was conducted, the light meter indicated an average of 34 footcandles in an area after 4 months of no maintenance (step 2). The lamps and reflectors were cleaned that night and the next night when the illumination was measured in the same area, the meter indicated 40 footcandles, (step 3). This shows that 6 footcandles (40 minus 34) were lost through the dirt that collected during the 4 months. Six footcandles is 15 per cent of the total of 40 available after washing. Divide 15 per cent by 4 months and a figure of about 4 per cent per month, "rate of depreciation through dirt collection," is obtained.

C—By estimating or by obtaining an actual cost of cleaning, it is now possible to determine from Table II the number of months that should elapse between cleaning of luminaries for a particular installation.

For example, taking the cost per outlet as figured in (A) above at approximately $20.00, with dirt collection at the rate of 4 per cent per month as (*Please turn to Page* 96)

**TABLE II**

**MONTHS BETWEEN CLEANING OF LIGHTING LUMINAIRES FOR OPTIMUM ECONOMY**

| Basic Annual Cost Of Light per Outlet (Section A) (excluding cost of cleaning) | Cost of Cleaning per outlet (Section C) | Monthly Rate of Depreciation Due to Dirt Collection (Section B) 4% | 6% | 8% | 10% |
|---|---|---|---|---|---|
| $12.50 | 10c | 2.1 Mo. | 1.7 Mo. | 1.6 Mo. | 1.3 Mo. |
| | 20c | 2.9 Mo. | 2.3 Mo. | 2.0 Mo. | 1.8 Mo. |
| | 50c | 4.4*Mo. | 3.6 Mo. | 3.0 Mo. | 2.6 Mo. |
| | $1.00 | 5.5*Mo. | 4.7*Mo. | 4.0 Mo. | 3.5 Mo. |
| $20.00 | 10c | 1.7 Mo. | 1.4 Mo. | 1.2 Mo. | 1.0 Mo. |
| | 20c | 2.3 Mo. | 1.9 Mo. | 1.6 Mo. | 1.4 Mo. |
| | 50c | 3.6 Mo. | (3.0)Mo. | 2.5 Mo. | 2.2 Mo. |
| | $1.00 | 4.7*Mo. | 3.9 Mo. | 3.3 Mo. | 2.9 Mo. |
| $30.00 | 10c | 1.4 Mo. | 1.1 Mo. | 1.0 Mo. | .8 Mo. |
| | 20c | 1.9 Mo. | 1.6 Mo. | 1.3 Mo. | 1.2 Mo. |
| | 50c | 3.0 Mo. | 2.4 Mo. | 2.0 Mo. | 1.8 Mo. |
| | $1.00 | 4.1*Mo. | 3.3 Mo. | 2.7 Mo. | 2.5 Mo. |
| $40.00 | 10c | 1.2 Mo. | 1.0 Mo. | .8 Mo. | .8 Mo. |
| | 20c | 1.7 Mo. | 1.4 Mo. | 1.2 Mo. | 1.0 Mo. |
| | 50c | 2.6 Mo. | 2.0 Mo. | 1.8 Mo. | 1.6 Mo. |
| | $1.00 | 3.6 Mo. | 2.8 Mo. | 2.5 Mo. | 2.2 Mo. |

* Estimated. In setting up this table the straight line relationship between time and the rate of dirt depreciation is valid for about 4 months. For periods longer than 4 months estimates have been made which are as accurate as can be made at this time.



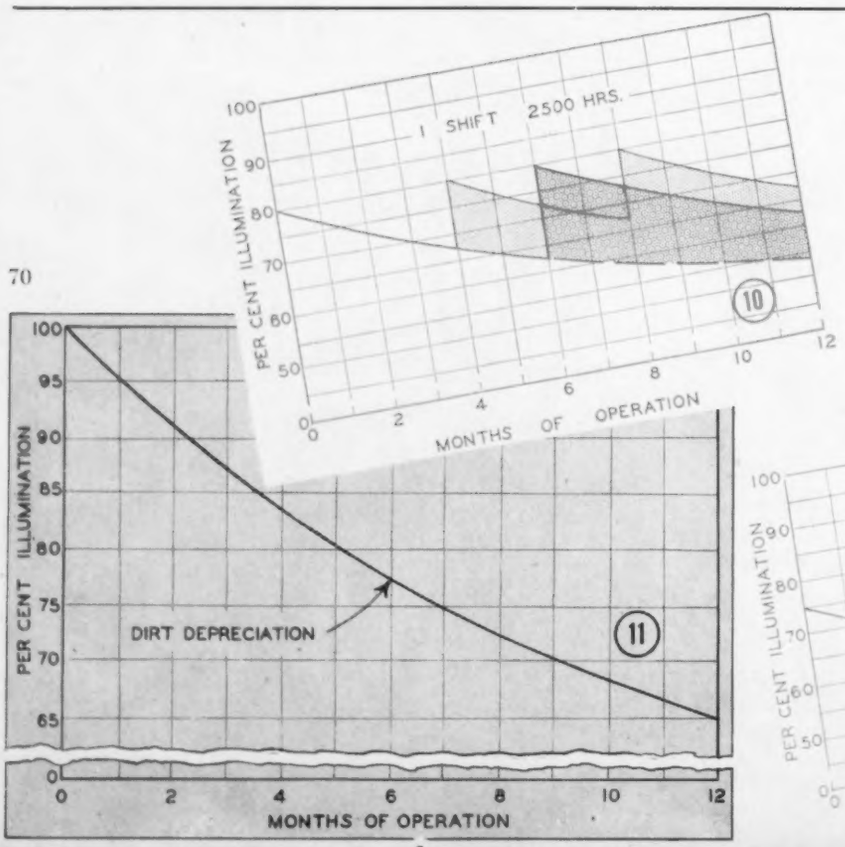
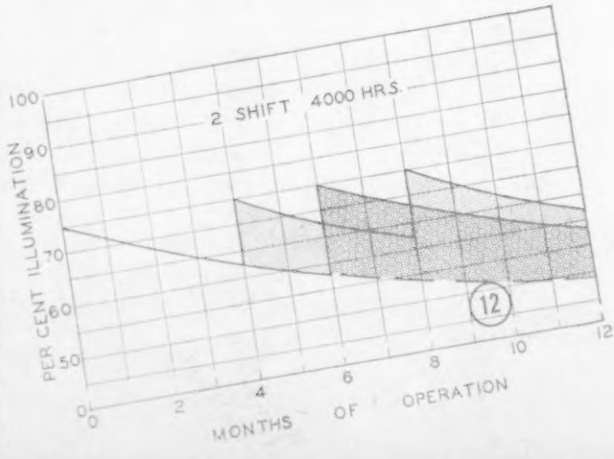



*Fig.* 11—*Depreciation of lighting equipment caused by collection of dirt and and dust in* 1 *year as expressed in per cent of initial of clean reflectors and lamps if rate of depreciation is assumed to be* 4 *per cent per month. Curve will vary depending upon condition and type of lighting system*







*Figs.* 10, 12—*Illumination in per cent of initial (after* 100 *hours) to be expected from a general fluorescent lighting system operating one and two shifts and cleaned two or three times a year. Shaded area represents light lost but paid for to the extent cleaning is omitted. Comparison between two and three cleanings is indicated by darker overlay pattern designating effect of cleaning at* 6*-month intervals*

# Seen and Heard in the Machinery Field

By GUY HUBBARD
*Machine Tool Editor*

**ECONOMICS OF AUTOMATICS:** Although Rhode Island is the smallest state in the Union, its influence in the machine tool industry is great—and has been since the beginning of that industry here in America.

A few weeks ago it was my privilege to visit Rhode Island, and to take a one-day "refresher course" in machine tool design. The place was the Potter & Johnston Machine Co. in Pawtucket. My "professor" was Norman R. Earle, vice president of the company.

The primary business at the Potter & Johnston plant is the design and manufacture of automatic chucking and turning machines and automatic turret lathes—fields in which this company pioneered around the turn of the century. My refresher course under Mr. Earle's tutelage was confined to engineering principles and economic considerations involved in redesign of automatic turret lathes to meet 1947 conditions.

As we went over the design of the new machine point-by-point, Mr. Earle unfolded the engineering and economics underlying its design. For example, ability to handle tungsten carbide tooling is a prime consideration. That, of course, means more speed, more power and greater rigidity than formerly were required. However, high speed steel machining is anything but a dead issue. Therefore a dual range of speeds—one for high speed steel and one for carbide tooling is desirable. It can be done through change gears.

At the same time, when boosting up speeds and feeds the fact must not be lost sight of that gains in that direction easily can be lost through lack of attention to the "material handling" phases of the work cycle. There is no use in shearing off a few seconds from cutting time, if these are lost in loading and unloading. Hence careful attention to quick, safe chucking and unchucking of work —in this case by compressed air.

By the same token, nothing is gained by spectacular machining when the cycle of operations is full of "non-productive time". Particular attention is paid to quick speed and feed changes and rapid traverse through electro-pneumatic control of multiple disk clutches, involving split second timing; high speed rapid traverse during noncutting phases of work cycle; automatic changes of speed to suit various operations on the work; quick starting and quick braking of spindle; and quick turret indexing without shock by Geneva mechanism.

Another important way in which economics should be considered—this time from the angle of the user—is in the matter of space occupied by the machine. In the old days there was some tendency to spread out a machine tool. Today the effort must be to get maximum working capacity into minimum machine size. The reason is simple. Floor space in modern plants is at a premium, it costs real money. Therefore, the more production per square foot, the more profitable the operation.

The final, but by no means the least, important angle on 1947 design with which I was impressed by Norman Earle during my Pawtucket sojourn, was that of the man who runs the machine. From the operator's point-of-view a machine tool must be safe; it must be convenient and easy to start, stop, load, unload and tool; it must help him to earn more—not hinder him; and it should have appearance which will give him a sense of confidence and pride and incentive to keep the machine clean.

My general conclusion was that in the design of 1947 machine tools, knowledge of economics and of the "human factor" rates on an equal plane with knowledge of the latest engineering principles. On the basis of this preview of things-to-come which I had down in Rhode Island, I foresee that careful study of the economics and the human factors involved in machines shown at Chicago in September, will be very much in order in evaluating them.

**RUTHMAN ON WEALTH:** As a guest contributor to this page this week, I introduce A. H. Ruthman, vice president, Ruthman Machinery Co., Cincinnati.

Mr. Ruthman has this message: "It is not the amount of labor we do that creates wealth, but rather its effectiveness. Wealth increases—not in *making* work but through *saving* work. Let us imagine the case of 100 people confined to an island where they are entirely dependent on their own labor. Suppose that the labor of all those people is needed to find enough food to keep them alive. Then that food is their sole wealth. They can possess nothing more because all their efforts are needed to feed themselves. They must feed themselves or die. Under such conditions they cannot have clothes or houses or furniture or any other comforts.

"Suppose further that a clever one among them invents a good weapon with which to hunt—a weapon so effective that only 50 people now are needed to feed the 100 Islanders. In that case, the work of 50 food getters is saved, therefore those 50 persons are set free to do other jobs. Those 50 so set free thereupon get to work constructing huts and fashioning garments. The little community thus becomes richer not because more work is done, but because a particular form of work has been saved.

"Suppose that 50 remaining food getters, by still further inventions, can be cut down to 25. With those 25 producing the food needed by the 100 Islanders, 75 now are free to do other work. Again the Islanders have become richer because work has been saved.

"A nation can only become richer by means of organization and inventions through which there is continuing progress in setting labor free to do other work. The arrangement of work in such fashion as to make it most fruitful is a very important thing and not everyone has a gift for such happy arrangement. Correct organization and invention save work. By saving work, they set free more and more labor to do other kinds of work. This is a most important economic truth, for the neglect of which we pay heavy penalties in poverty and distress."

DESPITE the emphasis placed on the chemical surface treatment of magnesium alloys to prevent corrosion, the fact should be recognized that in most applications a combination of surface treatment and organic finish will constitute the final protective coat. Most organic finish systems for magnesium will consist of either two or three different finishing materials, each applied in single or multiple coats.

Prime coats and top coats are a requisite and, in certain instances where a high finish luster is required or desirable, such as truck bodies, typewriters, and other business machines, and a variety of similar applications, a surfacing or filler coat may be applied between the primer and finishing coats. However, in the entire finishing system each of the materials used must exhibit certain qualities that are compatible with each other, with the magnesium alloy used, and with the conditions to be encountered during the service life of the product.

A large portion of magnesium products is dichromated by the producer prior to shipment. If parts are used as received, no additional chemical surface treatment will be required. If, however, certain manufacturing operations injure or remove a portion of the chemically treated surface, it will be necessary to re-treat before any organic finish is applied.

**Primer Coat:** In all organic finish systems the primer coat will be the first material applied. This means that the primer must not only exhibit anticorrosive and preservative qualities but, in addition, must serve as a bond or anchor between all subsequent coats and the magnesium alloy. Thus careful selection of a primer, in consideration of the service it must perform, is a major step in initiating an effective organic finish system.

Some of the requisite qualities[21] of a magnesium primer are listed as follows: (1) Resistance to salt water and moisture penetration; (2) good adhesion to the base metal or base film; (3) acceptable bonding surface for subsequent coats; (4) flexibility and toughness; and (5) corrosion retarding. Also, there are certain desirable qualities of a primer that may contribute to ease of processing of articles such as: (1) Rapid drying; (2) not affected by subsequent coatings; (3) impervious to sun rays; (4) insoluble in hydrocarbon solvents when dry.

Resistance to water and moisture permeability and penetration is the foremost factor in determining whether or not a primer may be used with magnesium. Moisture permeability implies greater danger than the actual softening and destruction of the prime coat. Unless the primer can effectively prevent moisture penetration, its purpose as a protective barrier between the base metal and exterior corrosive elements is of no consequence.

Although a primer for magnesium will seldom be called upon to adhere directly to the metal, it should exhibit the quality of anchoring itself to the film formed by an appropriate chemical surface treatment. Any primer coating that fails to adhere will soon lose its effectiveness, resulting in actual peeling of the film, or in blistering that substantially shortens its life. The primer coat must in turn furnish a bonding surface for subsequent coats of paint.

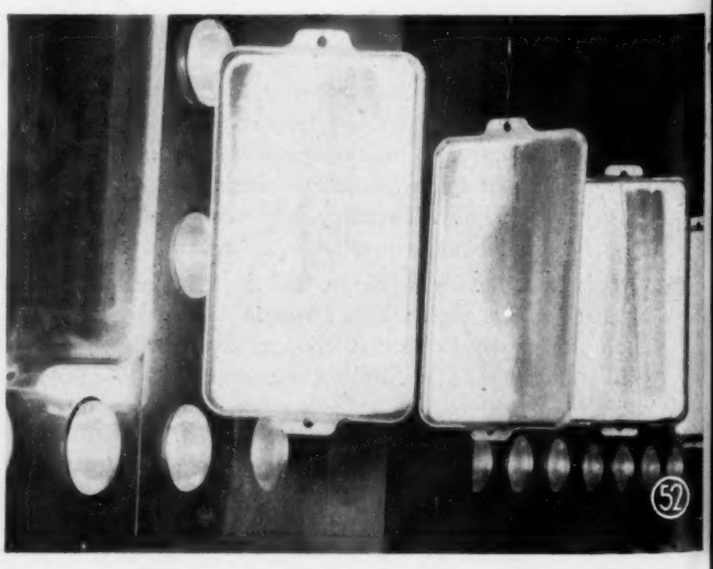
Since in this case bonding is generally accomplished by mechanical interlocking between the interfaces of both paint coats, use of a primer that develops a hard, smooth, lustrous finish should be avoided. It should be recognized that primers which will aid in inhibiting the corrosion of magnesium are desirable. In this connection pigments with an alkaline reaction should not be used; also, pigments containing ingredients conducive to galvanic action, such as graphite, should be avoided.

To meet the above requirements basic pigments are most satisfactory for use with magnesium, with zinc yellow exhibiting the most desirable all around characteristics. Use of red oxide as a primer pigment has met with good results, but is generally thought to require a baking operation to bring out the optimum qualities. Purity of the zinc yellow pigment used in primers for magnesium is important. Low chloride and low sulphate zinc yellows are desirable. Most pigment manufacturers recognize this and zinc yellow pigment with controlled chloride and sulphate content is now available for primer formulations.

**Vehicle for Primer:** In general, the selection of a suitable vehicle for the primer pigment is governed by the service demand of the finishing shop. A wide choice of materials is available. Oxidizing oils such as linseed oil give good service as primer vehicles, although they have the disadvantage of slow drying qualities. This necessarily slows the flow of products through the finishing department. The phenolic resin varnishes and tung oil, though both exhibit a high resistance to moisture penetration, are comparable to linseed oil in the length of drying time.

Combination of alkyd resins with phenolic resins gives products having very good primer vehicle characteristics. The nitrocellulose lacquers are fast drying primer vehicles but tend somewhat toward brittleness and poor adhesion. Combination of nitrocellulose lacquers with the alkyd resins increases flexibility, but the strong solvents required to bring about this combination are apt to soften and damage previously applied primer coats.

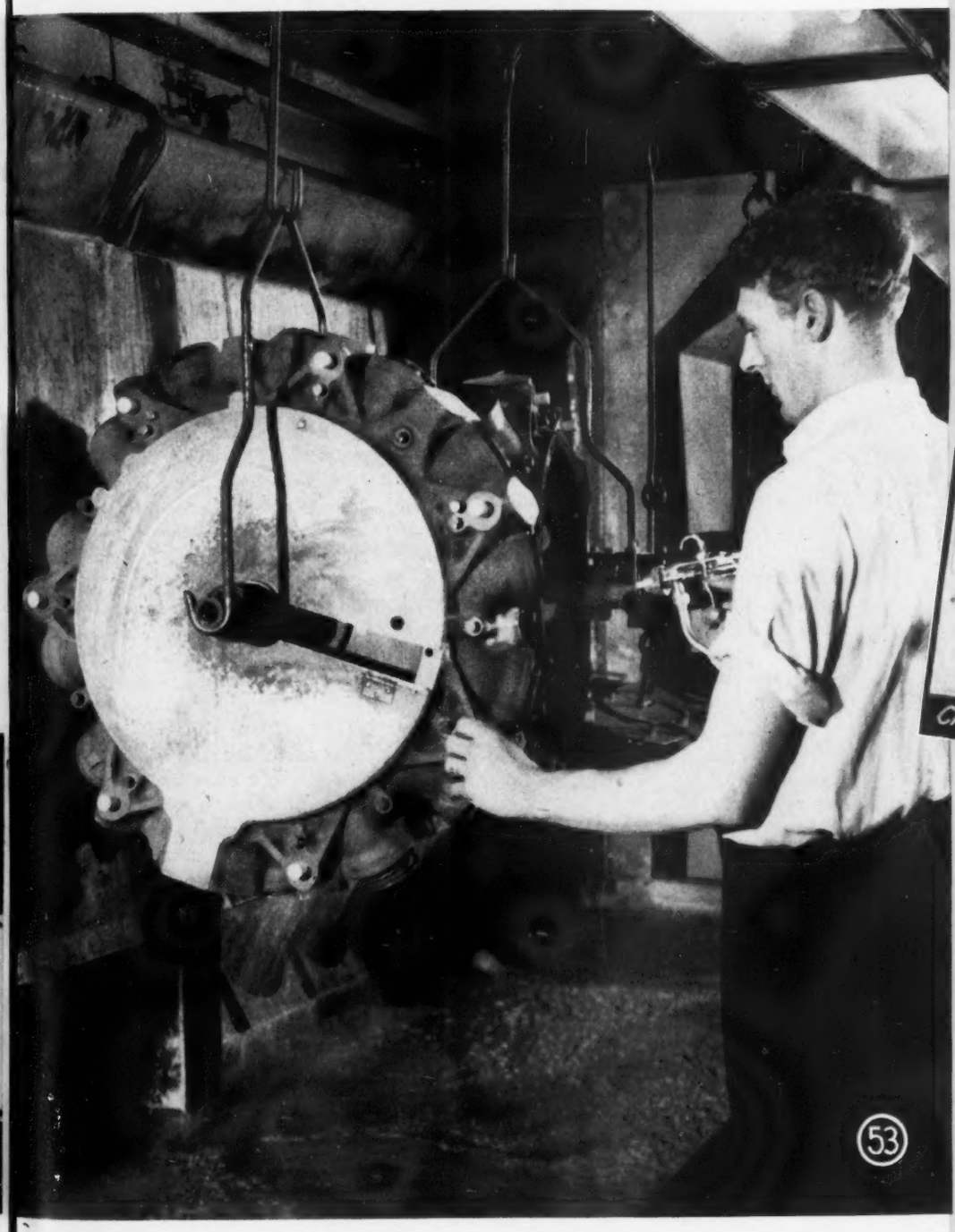
In the application of the primer coat care should be taken to assure even distribution over the entire surface. This is particularly important when the part has sharp radii or angular protrusions. Surface tension of the liquid primer tends to draw the coating thin over such areas and there is some danger that actual rupture will occur, thus leaving a small area of the base metal in an unprimed state. The primer should be applied in a thin



By ALLEN G. GRAY
*Consulting Editor, STEEL*

# Organic Finishes For Magnesium Alloys

*In most applications a combination of surface treatment and organic finish will constitute the final protective coat for parts made of magnesium alloys. This last article of the 11-part series covers the various finishing materials, their specific uses and methods of applying*



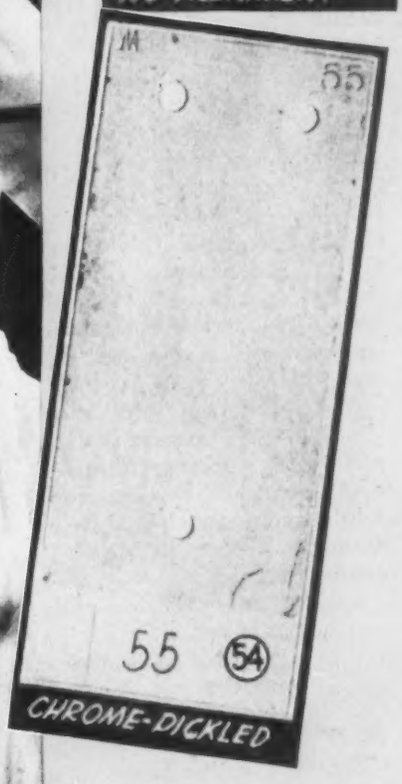



*Fig. 52—Infrared drying of wax-coated magnesium griddles*

*Fig. 53—Spray painting a magnesium casting*

*Fig. 54—Painted magnesium panels after one year of tide water test showing need for chemical treatment*

coat averaging 0.0005-in. in thickness. To insure complete coverage and maximum inhibitive value, it is generally recommended that two coats of primer be used.

**Finish Coatings:** For indoor exposure where the main requirement of a finish system is for decorative purposes, practically any type of paint properly applied over the primer will be satisfactory. However, in the selection of a finish coating material the high coefficient of expansion of magnesium should be taken into consideration since the more inelastic paints and enamels may crack and flake off if the article is exposed to extremes of temperature.

For mild indoor exposures, paint systems are sometimes applied directly over the chemically treated magnesium surface without the use of a primer. For ordinary exterior exposures free from industrial contamination the oil base synthetic enamels of the glyceryl phthalate or phenol formaldehyde type will give satisfactory results. A good grade spar varnish pigmented with aluminum paste in the ratio of 2 lb of paste per gallon of vehicle has been found to provide good protection.

Recent results on service data indicate that baked finishes are very effective for the protection of magnesium. Black japan and color coats are used for various kinds of product finishing. These materials are available in different lusters varying from flat to high gloss. Some of the best finishes for baking are the oil-base phenolic resin varnishes or enamels pigmented with aluminum paste. Certain plastic coating materials of the urea type are also used with good results. It is reported that satisfactory experimental results are obtained by the application of a baked urea-formaldehyde type coating directly to castings without the use of a priming material.

Baking finishes on magnesium alloys may be carried out in ovens or by means of infrared lamps. Consideration must be given, however, to the effect of baking times and temperatures upon the mechanical properties of certain magnesium alloys. Most finishes do not require baking temperatures in excess of 270 to 325° F, and baking temperatures within this range, in general, will not harm the properties of most magnesium alloys within a practical length of time.

The number of prime and finish coats required depends to a large extent upon the service conditions to be encountered. One coat of primer followed by one or two coats of finish is generally used when the product is subjected to indoor exposure. Often two coats of primer and at least two coats of recommended final finish should be applied for normal outdoor exposure conditions. Under extremely corrosive conditions multiple coats of primer, followed by at least three coats of final finish should be used for best results.

Appearance and sales appeal of magnesium alloy articles often can be greatly enhanced through the use of so called "novelty finishes," as are used on other metals. Although the term "novelty" might imply a lack of durability, many of these finishes have a permanent place in the field of metal finishing and provide good protection as well as appearance. The use of these materials will often reduce finishing costs since their natural roughness obviates the necessity for surfacing and grinding operations often required for the gloss enamel systems. Many novelty finishes are self-performing and yield crystallized, cracked, checked, mother-of-pearl, leather, hammered metal or wrinkled effects. By means of transfer and direct methods, it is possible to apply on magnesium articles, reproductions of almost any surface such as polished stone, cloth patterns, reptile skin, and wood grain.

**Previous Articles in Current Magnesium Alloy Series**

| Date | Page | Subject |
|---|---|---|
| Oct. 21, 1946 | 92 | Introduction, data on production facilities |
| Nov. 4, 1946 | 92 | Foundry practice |
| Nov. 11, 1946 | 150 | Die casting |
| Feb. 3, 1947 | 102 | Heat treating & machining |
| Feb. 10, 1947 | 100 | Machining |
| Mar. 3, 1947 | 115 | Riveting and spot-welding |
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| April 28, 1947 | 105 | Forming |
| June 9, 1947 | 82 | Finishing |

Chemically colored or buffed magnesium surfaces require a clear coating to protect them as much as possible against wear and tarnish. One to three coats of an approved clear lacquer is recommended. Standard types of lacquer such as are used for bright electroplated finishes are satisfactory.

**Decorative Treatments for Magnesium:** Polishing and buffing are used to produce an attractive bright metallic luster on magnesium. If protected with clear lacquer, this type of finish has limited application for decorative purposes. Buffing is most frequently used, however, as a preliminary step prior to plating or chemical coloring. Instructions on methods of polishing and buffing must necessarily be very general in scope since the requirements for individual jobs vary. Table XXV was prepared from actual operating data[19] to serve as a guide for the successful polishing and buffing of magnesium.

Sand and shot blasting, scratch brushing and similar mechanical methods can be employed on magnesium to produce special effects in conjunction with chemical and electrochemical coatings. However, the fact should be remembered that the corrosion resistance of magnesium alloys can be impaired by the presence of surface contamination. Thus certain of these mechanical methods may imbed particles of foreign materials in the surface. The particles can form galvanic cells in the presence of moisture. As has already been pointed out, the chrome-pickle or nitric-sulphuric-pickle should always follow sand, shot or grit blasting to provide satisfactory corrosion resistance.

**Chemical Methods:** Acid pickling can be used on magnesium alloys to produce either a bright metallic luster or a frosted effect. A bright acid pickle can be applied by alkaline cleaning and then immersing parts for 2 to 5 min in a bath of the following composition used at room temperature:

Chromic Acid ($CrO_3$) ..... 1.5 lb
Calcium, Magnesium, or Sodium Nitrate ..... 4.0 oz
Calcium Fluoride ($CaF_2$) .... 0.75 oz
Water ..... to make 1.0 gal

Following treatment in this solution the magnesium parts are rinsed immediately in cold water, followed by a dip in hot water to aid drying. Staining of the bright pickled surface is effectively minimized by adding 1 to 2 per cent of ammonium hydroxide to cold water rinse.

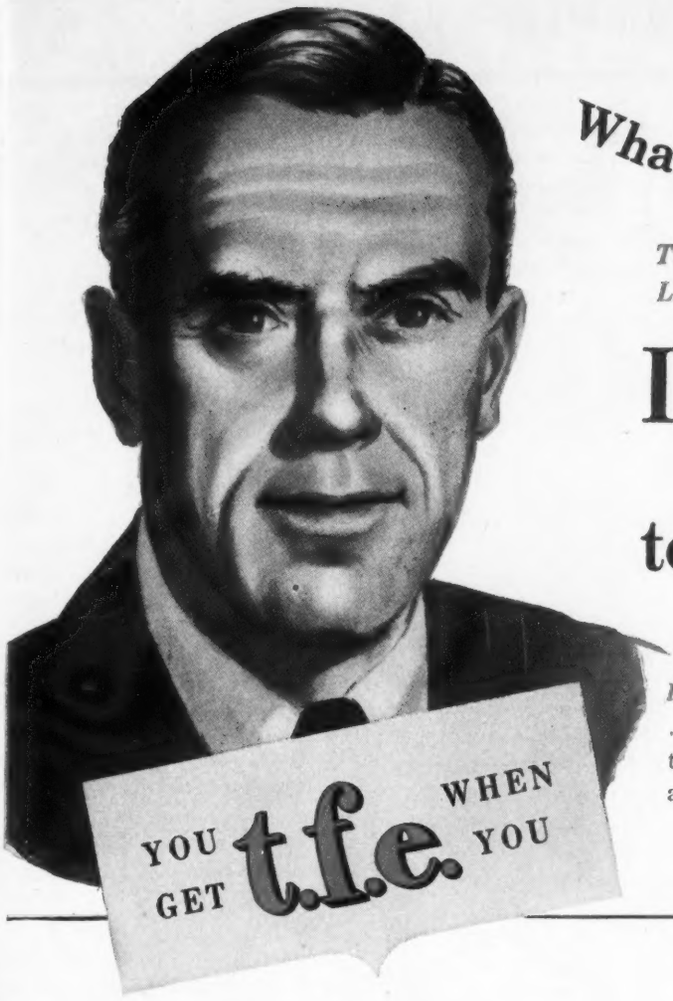
A matte or frosted effect can be obtained by immersing magnesium parts for 1 to 2 min in a 0.1 to 0.25 per cent acetic acid solution. As in the case of buffed surfaces clear lacquer should be used to preserve pickled surfaces.

Magnesium alloys can be provided with an attractive, dense, protective finish by a procedure known as the caustic-pressure process.[20] A current density of 10 to 20 amp per sq ft and 3 to 8 v potential is used. Time required for coating is 15 to 30 min at a temperature of 160 to 195°F. Coating produced is a neutral shade and may be dyed by boiling in aqueous solutions containing certain organic dyes.

**Refining Procedures:** The choice of technique for refinishing magnesium parts and structures will be determined largely by the size of the article requiring refinishing. If parts are small enough they can be immersed in a paint stripping bath, followed by chemical treatment and repainting. The following procedure is recommended for magnesium parts too large to be treated in this way.

If the original finish shows good adhesion, complete removal is neither necessary nor advisable. The old finish need only be sanded, due care being exercised that the finish is not sanded through to the underlying metal. Any loose paint should be removed and the metal beneath sanded until bright. If the general condition of the old paint job is poor

(*Please turn to Page* 101)




# What do Fasteners Really Cost?

*There's more to fastener cost than just price. Lots more. Personally . . .*

# I look for all 8 to get t.f.e.

True Fastener Economy

*It is the many costs of using a fastener that count* . . . not just the initial price. *True Fastener Economy* is the lowest *total* cost for fastener selection, purchase, assembly and performance.

**1.** Reduce assembly time to a minimum by savings through use of accurate and uniform fasteners

**2.** Make your men happier by giving them fasteners that make their work easier

**3.** Reduce need for thorough plant inspection, due to confidence in supplier's quality control

**4.** Reduce the number and size of fasteners by proper design

**5.** Purchase maximum holding power per dollar of initial cost, by specifying correct type and size of fasteners

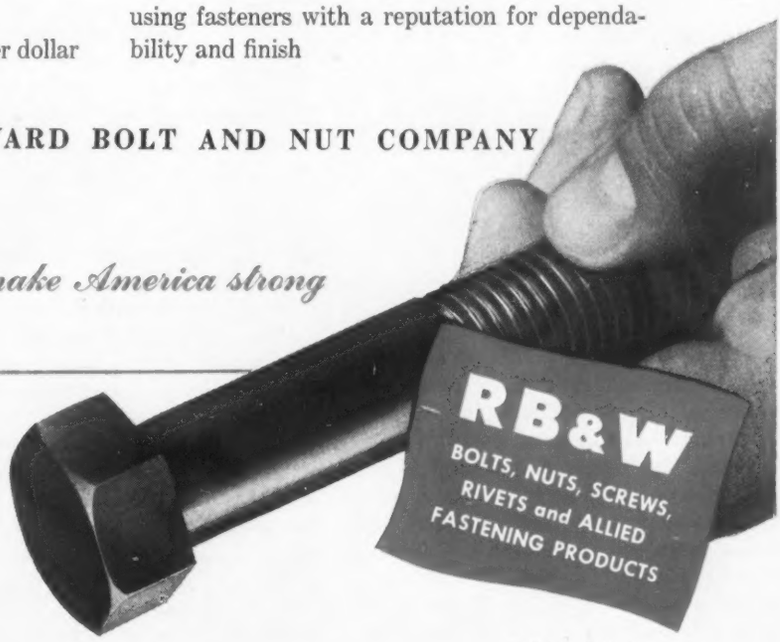
**6.** Simplify inventories by standardizing on fewer types and sizes of fasteners

**7.** Save purchasing time by buying larger quantities from one supplier's complete line

**8.** Contribute to sales value of final product by using fasteners with a reputation for dependability and finish

**RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY**

*102 years making strong*
*the things that make America strong*




Plants at Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at Philadelphia, Detroit, Chicago, Chattanooga, Portland, Seattle. Distributors from coast to coast. By ordering through your distributor, you can get prompt service for your normal needs from his stocks. *Also*—the industry's most complete, easiest-to-use catalog.

# Engineering News *at a Glance*

**DEFIES GRAVITY:** Defying the law of gravity, a spiral hopper feeder for plastic granules, developed by Miskella Infra-Red Co., Cleveland, makes the material literally "climb a tree" in feeding it as high as 7 ft to the hopper of a molding machine. Standing 8 ft high, the feeder consists of 57 aluminum "pie pans," 6-in. diameter and 1/32-in. thick. Stem of the "tree" is a tubular aluminum support which runs through holes cut in the center of the pans. Each pan is joined to become a helical link in the continuous vertical circular spiral stairway. Concealed in the base of the "aluminum tree" is an electronic vibrator producing twisting vibrations at the rate of 3600 per min to flow the granules a distance of 7 ft. Actually, each granule travels on the spiral over 50 ft to reach the 7-ft height.

**TO BROADEN DIESEL USE:** A new engineering achievement that may broaden the use of the 2-year-old gas-diesel engine in municipal power plants and other installations—that of obtaining fuel economy at light as well as full load—was revealed before the American Public Power Association recently in Cleveland. Gordon Lefebvre, president and general manager, Cooper-Bessemer Corp., Mount Vernon, O., predicted the development, together with an instant convertibility feature that enables the engine to run on oil during gas shortages, will increase the use of diesels in many industries.

**RADIANT HEATING GAINS:** Today, there are upwards of 10,000 radiant heating installations in the United States, and nearly a thousand new ones are being made each month, according to a nation-wide survey completed recently by A. M. Byers Co., Pittsburgh. In a cross section survey of 1000 typical installations located in 45 states, the company found that 16 per cent was represented by industrial installations. Commercial and residential installations accounted for 28 and 47 per cent respectively.

**RIVAL OF PISTON ENGINE:** Aircraft engineers predict the possibility of turbo jet development to a point where it may rival the piston engine in economy and range, according to *Trade Winds*, published by Wright Aeronautical Corp. One type of jet whose general configuration places it somewhere between the turbo prop and the turbo jet is the "ducted fan" or "ducted propeller" engine. The power plant is a combination of the pure turbo jet and a propeller type propulsion fan fastened to the main shaft by operating in a duct or scoop-like cowl encircling the exterior of the engine. The duct slows down supersonic or sonic entering airflow and brings it within the efficient operating range of the propeller. Thus the operating efficiency of the turbo jet at sonic speeds is not affected.

**EGG COAL INCREASES MILEAGE:** Use of mechanically cleaned egg-size coal enabled six modern coal-fired Niagara class engines of the New York Central Railroad to make greater mileage, from Oct. 1, 1946 through March 31, 1947, than was ever thought possible for a steam locomotive. This was revealed in Columbus, O., at Battelle Memorial Institute during a meeting of the motive power committee of Bituminous Coal Research Inc. Individual engines made world records exceeding 28,000 miles per month during the period. All six operated 787,818 miles for an average of almost 22,000 miles per month.

**TO ELIMINATE DUST:** By the spring of 1949, Electro Metallurgical Co. expects to eliminate about 75 per cent of the dust created at its Niagara Falls plant. Thus far the company has allocated funds totaling $4,250,000 to be used in the elimination program. Building of several new units as well as modernizing present equipment are included in the overall project. The company plans to convert its two open type calcium carbide furnaces into covered types, besides adding a new one. Also under study are the designs of two special vertical type kilns from which practically no lime dust will escape into the air.

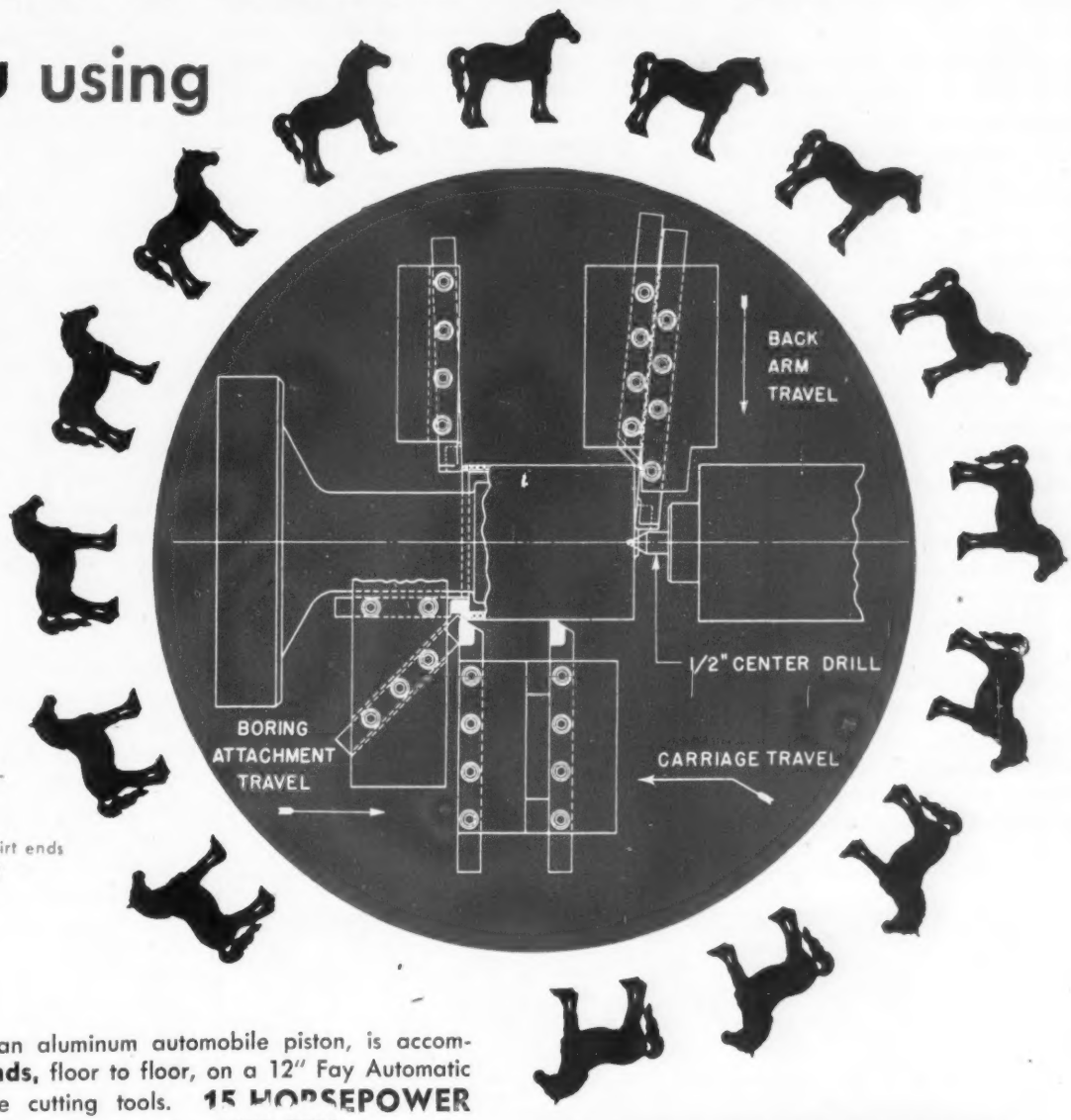
**USED IRON IN VACUUM TUBES:** In investigating the use of iron for vacuum tube parts, Jap engineers discovered that iron, when freed of occluded gases, possessed the durability and the electron emission characteristics comparable to those of molybdenum and nickel. The process, however, was tedious and costly, the Office of Technical Services, Washington, reports. Raw material for the iron used in the electron tubes was iron sand. This was reduced in an electric arc furnace and the iron metal drawn off. The metal then was melted in a high-frequency electric induction furnace and deoxidized with silicon and aluminum. As a result, the iron contained less than 0.02 per cent of oxygen. Large power tubes, however, required iron with an even lower oxygen content. To obtain such purity, the iron after deoxidation was heated in a stream of hydrogen at 1100° C for 2 hours. Final oxygen content then was less than 0.004 per cent.

**OXYGEN AT $7 PER TON:** Although still in the development stage, use of manufactured oxygen in steelmaking is far beyond the stage of experimentation, according to American Iron and Steel Institute. Full-scale commercial use now depends largely on the speed with which economical oxygen producing plants can be built adjacent to steelmaking furnaces. Several oxygen manufacturing plants which will serve steel plants are now under construction, and it is reported they will produce oxygen of 90 per cent purity at about $7 per ton.

**PLASTIC SEAL FOR CANS:** American Can Co., New York, reports it is using a plastic material in the side seam of some of its cans in order to gain greater sales through eye appeal. The material, developed during the war, is a water-white, taste-free organic compound. It is said to be so tough and impermeable to moisture that the Navy adopted it extensively to line fresh water tanks aboard vessels, and tested it as a corrosion inhibiting coating for under water parts of ships. The plastic-sealed containers are suitable for a variety of products except those that generate pressures within the can, require a vacuum pack or that must be processed.

**"HEAT PUMP" OUTPUT ASSURED:** Mechanical refrigeration industry would be in a position to supply at least 90 per cent of the basic component parts without engineering delays or production tool-up should the widely-publicized "heat pump" prove practical in operation and popular in demand. In pointing this fact out, E. M. Flannery, newly-elected president of the Refrigeration Equipment Manufacturers Association, stated that the refrigeration equipment makers are watching the development of reverse-cycle refrigeration with great interest. Many of them are conducting experiments to determine the usefulness and possibilities of this unusual method of heating. He explained that the system utilizes the same parts and machinery used in the ordinary refrigeration setup, including compressors, condensers, chemicals, expansion valves, thermostatic controls, motors, switches, tubing, coils, etc. Mr. Flannery declared, however, that the industry as a whole has no present plans

# How much **HORSEPOWER** are You using ?




1st. Operation on an Aluminum Automobile Piston:—
Rough turn O.D.
Face head and skirt ends
Center closed end
Rough bore skirt
Finish bore skirt
Chamfer skirt

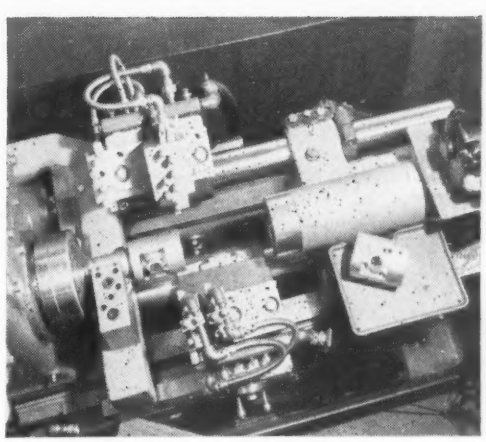
This operation, on an aluminum automobile piston, is accomplished **in 15 seconds,** floor to floor, on a 12" Fay Automatic Lathe using carbide cutting tools. **15 HORSEPOWER** is required. The surface speed used is **1250 FPM.**

Carbide cutting tools have increased horsepower requirements as much as 300 per cent. They have increased cutting speeds 200 to 500 per cent.

Be skeptical of the production efficiency of your metal turning equipment. The chances are that turning accounts for 25 per cent or more of all machining time in your plant—that this is your major production expense.

There are cases in our files of savings of hundreds of dollars a month in the manufacture of a single part by the efficient use of carbide cutting tools on Jones & Lamson machines. Our Turret Lathes and Fay Automatic Lathes are designed specifically for the most efficient use of these tools.

Send for our folder "Machining Automotive Pistons". Or better yet, telephone or write for a Jones & Lamson engineer who will be glad to consult with you on all phases of your metal turning problems.



**JONES & LAMSON** MACHINE COMPANY, Springfield, Vermont, U. S. A.

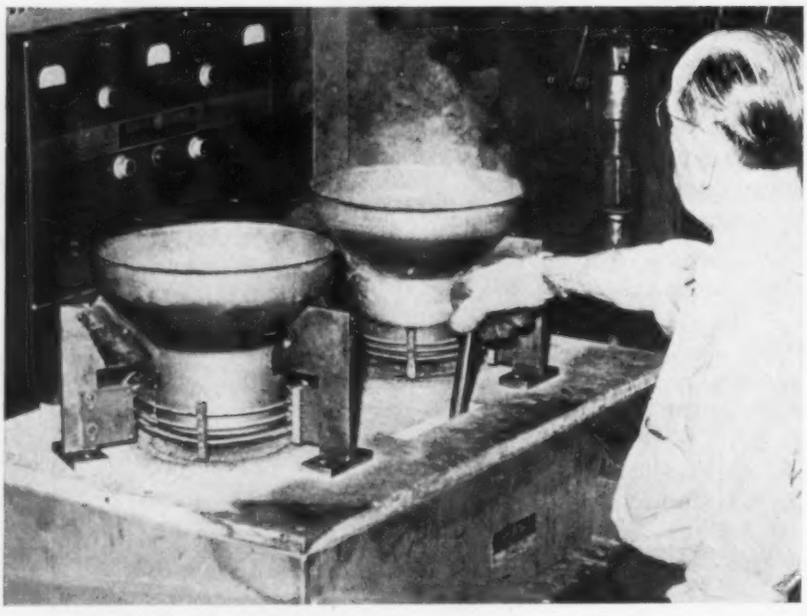
Manufacturer of *Fay Automatic Lathes* and Universal Turret Lathes •
Fay Automatic Lathes • Automatic Double-End Milling and Centering Machines • Automatic Thread Grinders • Optical Comparators • Automatic Opening Threading Dies and Chasers • Ground Thread Flat Rolling Dies

for going into the heating business, but that it is continuing its co-operation with heating engineers especially in systems including both heating and cooling.

**OUTPRODUCES CURRENT METHODS:** Current tooling in brass shops is outproduced by 25 to 53 per cent by a new machine tool for handling nonferrous materials developed by Warner & Swasey Co., Cleveland. Preselection of any working sequence is quickly set up by simple adjustment of the automatic control mechanism mounted on the ram of the 16-in. Electro-Cycle turret lathe. Since the latter is mechanically co-ordinated with each face of the hexagon turret, spindle starts automatically, stops, reverses or changes speed for threading in any order desired, whether the turret indexes forward, backward or skip-indexes. Manual operation of headstock is eliminated, and the spindle is braked to a stop at the end of each work sequence in preselected position for fast reloading of the air chuck.

**MORE ENERGY FOR BOMBERS:** First practical application of alternating-current electric plants for aircraft, Westinghouse aviation engineers disclose, provides 50 per cent more power per pound of weight. Designed and built by the company in co-operation with the AAF, the generators weigh a little less than 75 lb, and are only 19 in. long and 9 in. diameter. They are driven from the main engines through a constant speed drive at 6000 rpm. At this speed, each generator produces 40 kva. According to J. D. Miner, manager of aviation engineering for the small motor division, Lima, O., the newly developed equipment was installed on two of America's giant bombers —the Consolidated B-36 and the Northrup Flying Wing.

**HIDDEN POWER:** Forty or 50 different tasks are accomplished with electricity in an average air liner. On the 67½-ton Boeing Stratocruiser more than 100 are accomplished, some of them pretty big—such as lowering or raising the landing gear. This one job involves moving nearly 3 tons against the barrier of air rushing past the plane in flight. More than 70 kw are required to perform the many electrical chores aboard the craft. This is enough to supply the domestic needs of an average American community of 144 homes with a population of 700. An airplane must do the same job with equipment weighing a small fraction of what a comparable ground installation weighs. Boeing magazine reports that in the giant plane the task is achieved with reliability equal to the best stationary system on exactly 2523 lb of generating and distributive electrical equipment. This includes 10 miles of wire of various sizes, six direct-current generators and two alternators. All this is designed into the big craft so efficiently that even the men flying the plane are scarcely aware of the power at their command.

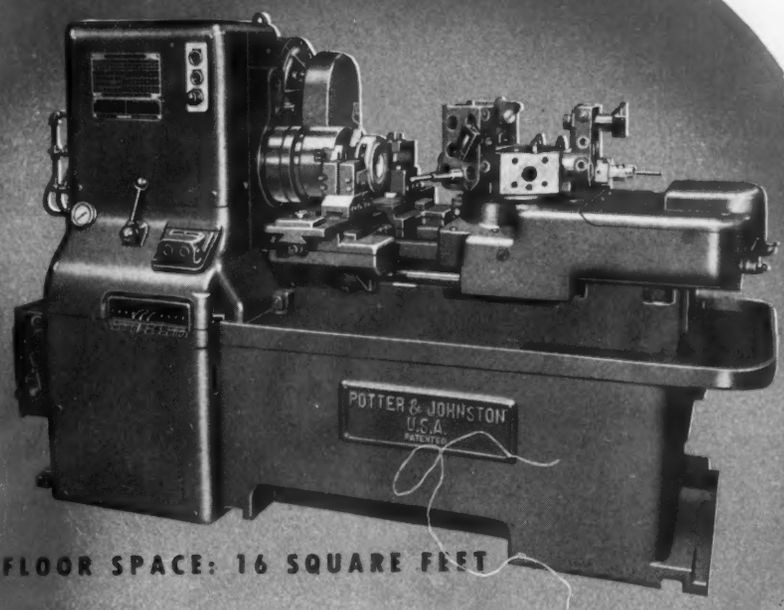


**BOOSTS MILK CAN OUTPUT:** Two electronic heaters in the production system of Buhl Mfg. Co., Detroit, now enable one operator to anneal more milk cans than previously possible with two men. The new setup also is lessening manufacturing costs. It increases production by enabling the operator to anneal as little as 1 in. of the container's neck, rather than the entire breast of the can. Each General Electric heater in the production line is equipped with a 2-position transfer switch. Thus while one neck is being annealed in one position, the other is being unloaded and readied for another cycle. At the end of the cycle, as shown above, power is transferred from one position to the other. Formerly, not only was the entire breast of the can annealed in a furnace, but it also was pickled to remove scale

**TO CARRY LATEST TEST DATA:** Five of the nation's leaders in the field of mechanical testing recently finished correlating the most recent data on mechanical testing of ferrous and nonferrous metal for publication in the American Society for Metals 1947 handbook soon to be distributed. According to W. H. Eisenman, national secretary of ASM, the articles prepared by these men will comprise a new section in the volume. They will cover general mechanical testing, specific tests and applications of the various tests to particular products.

**DOORSTEP DEMONSTRATIONS:** In Johnson City, N. Y., it was learned, Ozalid is building a fleet of trailers—literally luxurious sales offices on wheels —to tour the country in demonstrating its product to business executives. The fleet, which will operate right at the prospects' own doorsteps, not only will be instrumental in demonstrating how the company's Streamliner reproduces typed, drawn, printed and photographic materials in 30 sec, but will serve as a device for making quick deliveries to interested buyers. Each of the trailers is arranged to carry a spare machine for the purpose.

**DISTILLED FROM BOILERS:** Water soluble deposits on steam turbine blades are the result of carry-over of boiler water containing the salts into the steam, while insoluble type, consisting mainly of silica, is found to be the result of a volatile silica compound being formed at higher steam pressures, according to bulletin 364, issued recently by the Engineering Experiment Station, University of Illinois. The study shows that salts normally found in boiler water are not appreciably soluble in saturated steam at pressures below 2000 psi. However, these salts are soluble in superheated steam pressures as low as 600 psi. In a series of tests, the experiment station found that silica, possibly as silicic acid, distills off from the boiler water in appreciable amounts above 600 psi. At 1500 psi, the silica in steam is found to about 1 per cent of the silica in the boiler water. Silica as low as 0.2 ppm in steam will cause deposition in the turbine.




FLOOR SPACE: 16 SQUARE FEET

# *The question behind any automatic lathe is:*

# *can it increase production at lower unit cost?*

# *With the* **3-U** *Automatic Turret Lathe, we say "Yes!"*

Greatly increased hourly pay of machine operators upsets time study men and shakes up cost accounting. One method whereby operations can be profitably balanced is to use a machine that INCREASES PRODUCTION AT A LOWER UNIT COST. P. & J. Automatic Turret Lathe, newest addition to a long line of automatics designed for profitable production, is built to give the HIGHEST PRODUCTION PER OPERATOR. Known as the 3-U Automatic Chucking and Turning Machine, it is another demonstration of superiority over hand machines, both as regards to the quality of the finished product and increased output, as well as to a corresponding reduction in the labor costs for producing the work. There are 48 changes of speed between 36-711 RPM and 73-1445 RPM. These speeds are arranged in six sets of four automatic changes. The feed gearing is driven from the spindle, causing the feeds to vary directly with the spindle speed.

There are 24 feeds arranged in geometric progression, and there are three automatic variations of feed. The P. & J. 3-U Automatic is not an experiment: it is a full-fledged member of the P. & J. line of automatics, already living up to its manufacturers' claims on the industrial firing line.

P&J

**Potter & Johnston Machine Co., Pawtucket, R. I.**

# NIGHT COOLING

## *Industrial Plants*

PRINCIPLE of using fresh cool night air for hot weather comfort for industrial workers has many possibilities as a low-cost efficiency-promoter in metalworking shops. The so-called "night cooling" system merely utilizes directly one of nature's gifts.

Heat of a midsummer day penetrates and is absorbed by the building structure, machinery and products being manufactured. It is common practice, when the day shift is ended, to close the plant to avoid damage in case of a sudden rain. As a result, the daytime heat is retained inside the building, and on the following morning workers come into a heavy, hot, humid atmosphere that is little better than the peak heat encountered the preceding day.

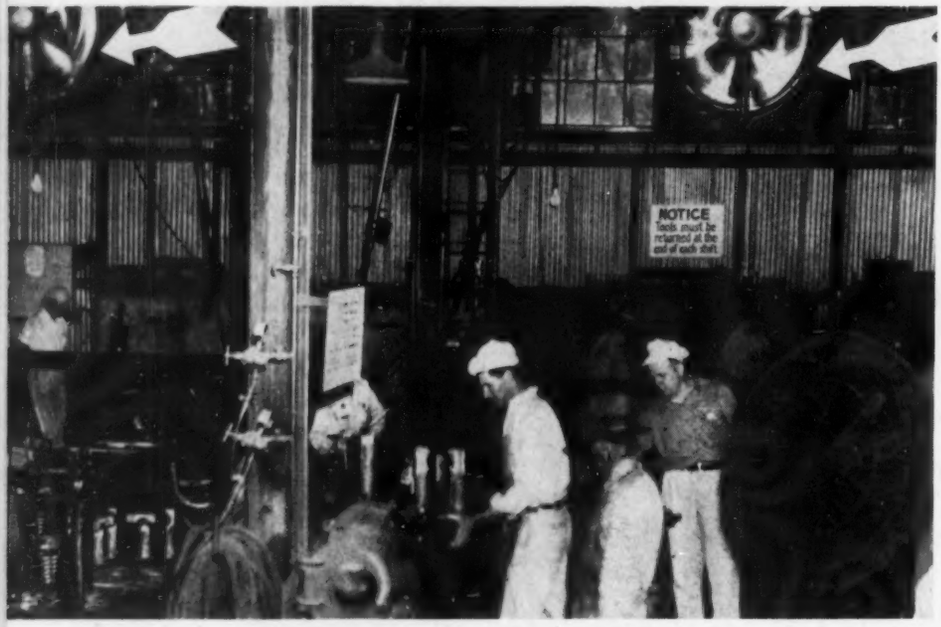
Nature provided her own "air conditioning" system. When the sun goes down, even during extreme heat waves, the outdoor temperature drops 10 to 30°. Engineers of Ilg Electric Ventilating Co., Chicago, have harnessed this factor to bring heat relief in all types of buildings.

For example, at the New Orleans plant of Higgins Industries Inc., motor propeller fans or power roof ventilators are installed in walls, windows, skylights or on the roof. Actuated either by electric time clocks or by maintenance crews, the fans are turned on as soon as the outdoor temperature goes down, and are stopped early in the morning. Heat, odors, dust, steam and other unwanted air contaminants are driven out of the building as night air is drawn in from outside.

Inside temperature is lowered as much as 20° and the atmosphere is fresh and inviting when the day shift comes to work. Daytime ventilation is handled in the regular manner. Fig. 1 is the Higgins pipe shop and shows two 72-in. M Ilg cooling and ventilating fans on rear wall.

In the machine shop, Fig. 2, two 36-in. fans with automatic shutters exhaust vitiated air, introduce fresh air. Clock house and washrooms are equipped with 12-in. fans commonly installed in homes to expel greasy grime and cooking odors. Fans of various capacities are used in the battery testing and repair room, electrical construction department, maintenance department and in the cafeteria kitchen.

The battery testing and repair room is equipped with a 36-in. M fan and automatic shutter to draw off acid-filled fumes and dust. Hazards are reduced and employees' health protected.



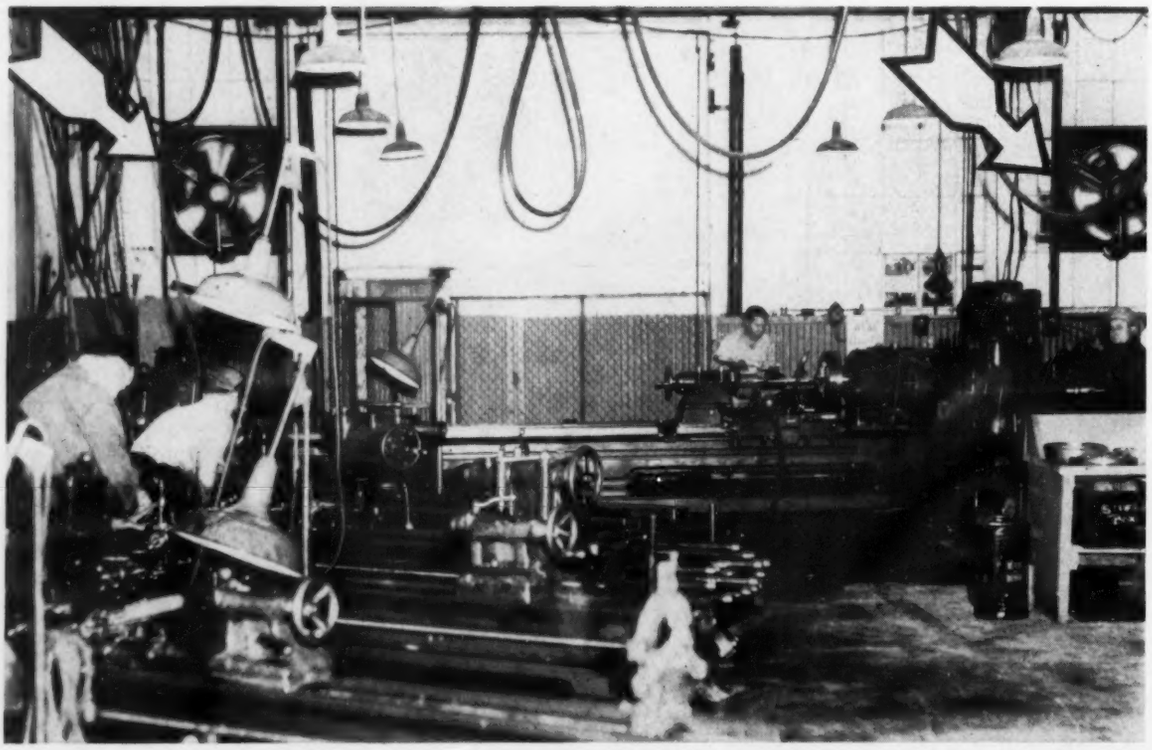



*Fig. 1—(above) Two 72-in. fans are used here to cool and ventilate the pipe shop*

*Fig. 2—(right) View shows the 36-in. fans in the machine shop which exhaust vitiated air and introduce fresh air*

## Save machining time, produce accurate parts

***With J&L Precision Ground Cold Finished Steel***

The size accuracy and surface finish of J&L Precision Ground Cold Finished Steel is used to advantage by many manufacturers in machining parts. They find it eliminates part of the machining operation, saves tool wear and tool changes. J&L Precision Ground is available in a wide range of grades in sizes ¼" and larger from mill or your nearest J&L warehouse or distributor.

**JONES & LAUGHLIN STEEL CORPORATION**

PITTSBURGH 30, PA.

# JESSOP and ALAN WOOD

## *complete working agreement*

## for expanding production of stainless-clad sheets

Jessop Steel Company and Alan Wood Steel Company announce the completion of a working agreement for large scale production of stainless-clad sheets by the patented Armstrong method.

Combined technical knowledge, experience and equipment of both companies will be utilized in expanding production.

Stainless-clad sheets will be available in greatly increased quantities for industrial equipment, commercial products, and home appliances.

New opportunities are open to manufacturers who recognize the advantages of stainless-clad sheets in modern design.

Consider the items you manufacture . . . may we assist your design engineer?

**JESSOP STEEL COMPANY**
Washington, Penna.

**ALAN WOOD STEEL COMPANY**
Conshohocken, Penna.

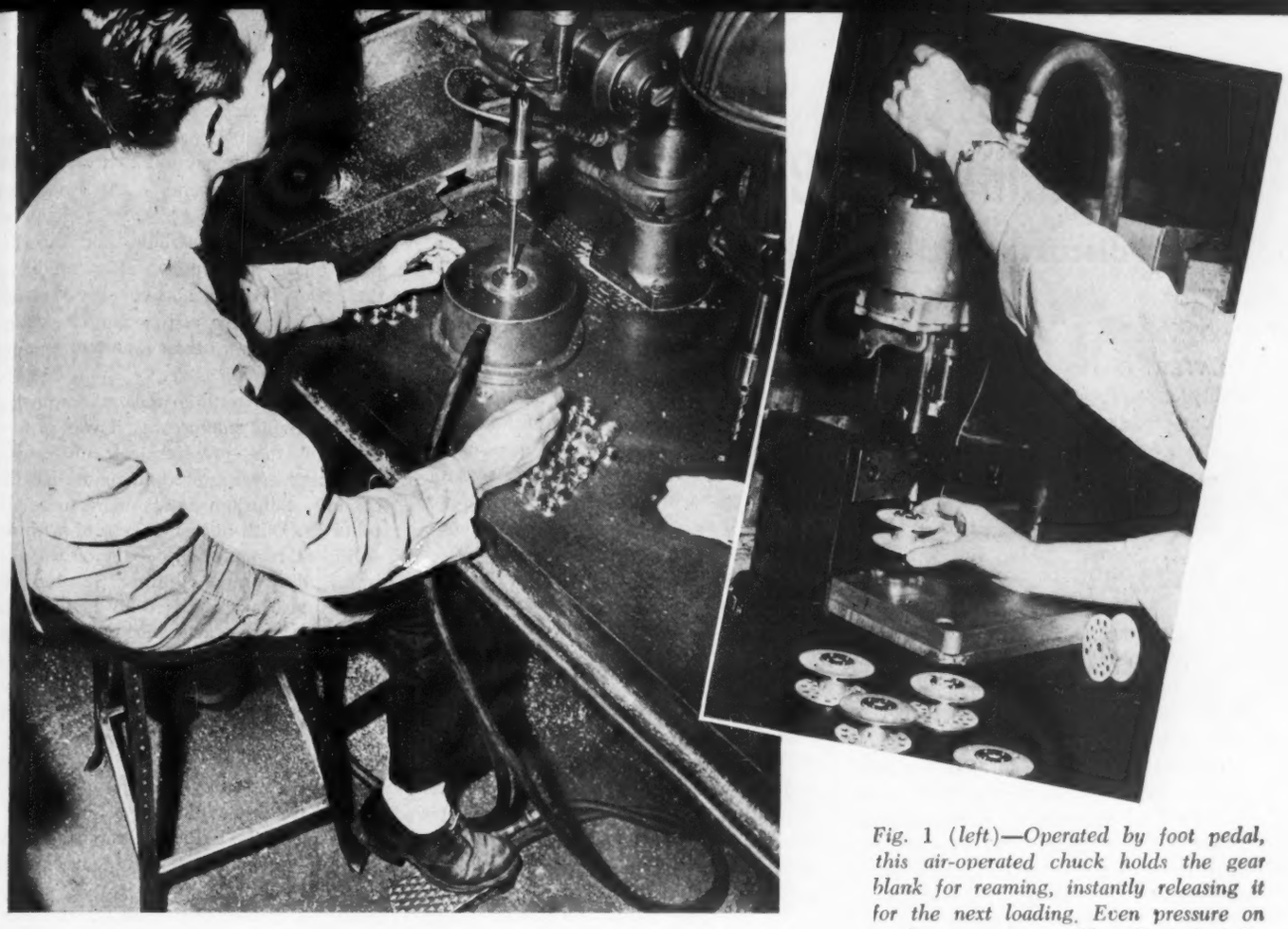


*Fig. 1 (left)—Operated by foot pedal, this air-operated chuck holds the gear blank for reaming, instantly releasing it for the next loading. Even pressure on work prevents possible elliptical holes after pressure is released*

*Fig. 2 (above)—One of several types of squeeze riveters used in the manufacture of fishing reels. This one is engaged in assembling fly reel spools, the finished product shown in foreground*

# Compressed Air Power

## ...Provides Close Tolerances for Reel Production

CLOSE tolerances in cutting the parts of fly and bait casting reels and uniform pressures in fitting them together are obtained by one manufacturer by the use of compressed air-operated tools, and devices in many of the operations. In making the reels, Langley Corp., San Diego, Calif., recently worked out some unique methods in getting the accuracy required for a free-acting reel and, at the same time, getting production costs down.

Typical example of the several applications for compressed air in this company's factory may be seen in Fig. 1, where an air chuck is used for reaming a gear blank. The chuck pulls the blank down and holds it firmly in place during the reaming. The finished piece must be true, otherwise, the fishing reel would be noisy and irregular in operation. Hand methods of tightening the piece might cause a distortion after pressure was released, but the even action of compressed air eliminates that danger.

Air chuck illustrated is removable and may be used on other machines, a tapping machine for example, when other operations requiring speed and trueness are needed. Another typical application of air chucks would be found on the milling machines on work such as slitting a level-wind tube where six pieces are cut in one 30 sec operation.

Tolerances of plus or minus 0.003-in. are common practice and compressed air is constantly used in cleaning dies and work to prevent distortion or indentation in cutting and fitting.

All punch presses are equipped with the type of safety device whereby the operator cannot trip the press until both hands—not just one or the other—are on the levers at either side of the machine, keeping his hands out of the way of the press action. The two levers pressed at the same time release compressed air to actuate the press. When the press has completed its punch, compressed air automatically is released to clean the die of the shavings.

Care in assembly equal to that in the manufacture of parts is necessary to deliver a finished product which will satisfy a champion caster or a novice. Recognizing that the strength of people in the assembly department varies, and therefore the pressure each one would apply also varies, many fitting jobs are done with the aid of the even pressure of compressed air to avoid variations. The squeeze riveter used in assembly of fly reels, is an example of the equipment used in this way.

Air chucks are used in assembly as well as in manufacture. One of these applications is that of holding the fly reel shaft while screwing the assembly to the correct torque. It would be impossible to obtain this result if held by hand and the mechanical jaws of a vise not only would require the time of tightening and releasing by hand, but also would spoil the smoothness of the shaft which rides in a bearing.

A typical application for air hammers is in knocking down four small rivets at one time on the fly reel spool. Squeeze riveters are used in a number of ways, one being illustrated in Fig. 2, where the operator is assembling a fly reel spool. This same type of equipment also is used for squeezing bearings out and in place on the fly reel spool, an operation for which there is no other satisfactory equipment to use.

# Hardenability Developments

## . . . . . discussed at British Iron & Steel Institute meeting

LATEST developments in the hardenability of steel were discussed in a symposium presented at the annual meeting of the British Iron & Steel Institute in London in May. Presented before a meeting which included members and guests from Czechoslovakia, France, Luxemburg, Norway, Poland, Spain, Sweden and Switzerland, the symposium was concerned almost entirely with the end-quench test introduced in 1938 by Jominy and Boegehold.

Conclusions of the subcommittee on hardenability as presented before the meeting were as follows: The end-quench is capable of yielding satisfactory reproducible results provided that the material tested is homogeneous; results of such a test are not appreciably affected by small changes in testing conditions; end-quench curves determined on different samples of bars, forged or rolled from the same ingot to approximately the diameter of an end-quench test specimen, generally show only small differences; end-quench curves determined on different samples of bar, forged or rolled from different ingots of the same cast to approximately the same diameter of an end-quench test specimen generally show only small differences; a marked variation of hardenability may exist across the section of a bar; end-quench hardenability of a steel may be slightly affected by variation of the structure before quenching.

Above conclusions deal with the reproducibility of end-quench hardenability curves, determined in a number of laboratories on samples of three different steels cut from commercially homogeneous bars. Regarding hardenability and chemical composition, it was concluded that a wide variation in end-quench hardenability may exist between different casts of steel produced in the same conditions; hardenability of steel cannot always be calculated with satisfactory accuracy from a knowledge of the chemical composition and grain size.

Dealing with the prediction of the hardness of quenched and quenched and tempered bars from hardenability curves, the subcommittee came to the following conclusions:

Hardness traverse curves of an oil quenched bar cannot be derived consistently with adequate accuracy from a single end-quench curve; and hardness of a quenched and tempered bar may be derived with satisfactory accuracy from an end-quenched and tempered test specimen.

Dealing with hardenability and mechanical properties, it was concluded: The combination of mechanical properties obtained from steel that has been quenched and subsequently tempered in the range 932 to 1202° F depends on the hardness developed by quenching. Final conclusion, dealing with the transformation temperature ranges, was: Transformation-temperature ranges of steels during continuous cooling can be determined approximately from a series of interrupted end-quench tests. Many of the features of graphite formation in cast iron needing explanation, together with an examination of the numerous theories developed from time to time were included in the paper, "Graphite Formation in Cast Irons and In Nickel-Carbon and Cobalt-Carbon Alloys."

From the study of the process of graphite formation in several alloys, the paper stated that it was found that undercooling in these alloys and in cast iron takes place by the solidification of a eutectic of solid solution plus carbide, and the carbide phase decomposed after solidification. Nickel-carbon and cobalt-carbon alloys tend to give coarse graphite when they contain more than a certain amount of sulphur.

By metallographic means employing the polarizing microscope, it was proved that in the presence of an excess of manganese required to neutralize the sulphur, tellurium forms manganese ditelluride. With no manganese or with insufficient manganese to balance the sulphur, iron monotelluride is formed. Papers also were given on methods of obtaining more accurate determination of liquid steel temperatures. The first discussed the use of motion pictures, and the second dealt with various physical and chemical experiments and tests to determine the causes of contamination of platinum and platinum-rhodium wires used in thermocouples.

Experimental difficulties associated with operation at melting temperatures have been avoided by conducting experiments at lower temperatures, the heat transferred to the hearth being measured by means of calorimeters. Following the previous laboratory investigation of the phosphorus reaction in the basic steelmaking process at 1585° C, the work has been extended to two other temperatures—1550 and 1635° C. In each case a series of slags of varying lime content and with compositions covering the normal range of basic practice were used.

Some of the fluctuations of the distribution of torque between rolling mill spindles were stated to be periodical and in step with the roll revolutions, the paper stated, they being attributed to mechanical imperfections of the driving gear. Other nonperiodic fluctuations are thought to be caused by the surface condition of the rolled stock.

---

## Unit Demineralizes Water For Electroplating Use

Raw water used to replenish electroplating solution losses from evaporation often leads to gradual concentration of natural solid impurities which tend to cause undesirable side reactions at the cathode.

The plating of more than one metal on an article frequently necessitates a water rinse between plates to prevent solution contamination. Subsequent evaporation of raw water leaves a mineral deposit which, like the replenishment use, results in a weak structure of the final plate.

Demineralizing systems, designed to remove the mineral contamination from raw water, have been developed by Cochrane Corp. of Philadelphia, the processed water being suitable for plating solution replenishment and wash water between baths, the company reports. Water is first passed through a resinous ion-exchanger which has the ability to exchange hardness ions such as calcium, magnesium and sodium for equivalent quantities of hydrogen.

The effluent is then passed through an acid adsorber in which the mineral acid molecules are retained by another resinous material. Carbonic acid may be removed by aeration, it is stated. Regeneration of the resins permits further use, the ion exchanger being regenerated ordinarily by sulphuric acid and the acid adsorber by soda ash.

—o—

Completion of a large number of stamped metal parts, produced for a space heater manufactured by General Electric Co., has been announced by Paul & Beekman Division of Portable Products Corp., Philadelphia. The stampings are of 0.025 and 0.050-in. cold rolled steel and comprise the reflector and base of the heater.

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# What About the Use of

# Oxygen in Steelmaking?

By JOHN D. KNOX
*Steel Plant Editor, STEEL*

*How improved procedure in use of lances greatly extends life of steel pipe is explained in this the second and concluding installment. Smoke elimination achieved by various methods. Furnace performance affected largely by purity of oxygen. Large volumes of oxygen transported in liquid form in railroad cars*

OXYGEN injection into the open-hearth bath during refining to accelerate carbon reduction rate has received almost as much attention as oxygen enrichment through burners to accelerate meltdown. Injection into the bath is one of the most effective methods of utilization of oxygen, particularly in shops where large quantities of hot metal are charged, with consequent melting-in at high carbon, or where low-carbon steels are made.

The chief advantage of oxygen injection into the bath during the refining period lies in its acceleration of carbon reduction. The rate of carbon reduction achieved by normal ore practice in an open hearth averages about 0.5 point per minute. Using 100 to 300 cu ft of oxygen per ton of metal accelerates the rate by factors of 3 to 5.

Oxygen injection into the bath for carbon reduction is accompanied by a rise in temperature. Injection of 1 cu ft of oxygen per ton raises bath temperature of 1.1°F, assuming that all heat enters the steel. One point of carbon reduction then theoretically corresponds to a 2.9°F increase in bath temperature. The overall reaction for carbon reduction with ore[1] reduces bath temperature 3.9°F per point of carbon removal.

Most of the oxygen injection work has been performed using lengths of steel pipe (lances) to introduce the oxygen into the bath. Oxygen may also be injected into the bath with the water-cooled Linde jet device.

A number of shops have now developed methods of using pipes that have increased the life of a 20-ft 1 in. pipe from several minutes as initially practiced to periods sometimes as long as 1.5 hours. Rapid replacement of pipes had characterized early work with lances. Improved procedure comprises starting flow of oxygen through the pipe at maximum rate before inserting the pipe into the furnace (thereby supplying an appreciable amount of cooling), inserting of the pipe to a point just above the slag-metal interface, and using a two-wheel movable stand to reduce labor and hold the pipe in the proper position. Normal operating position of the lance is indicated in Fig. 7.

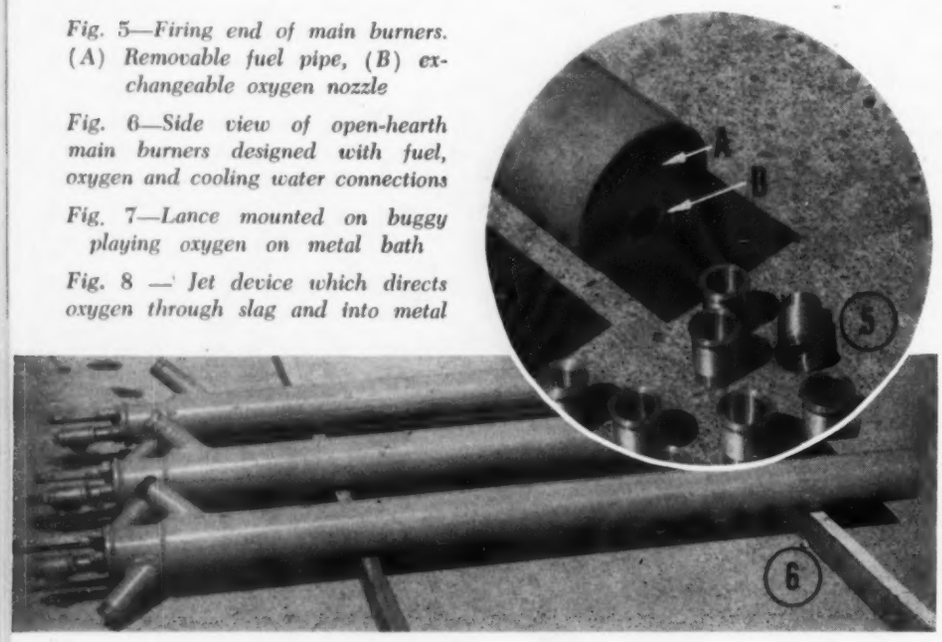
Although much more satisfactory performance is achieved with lances at present than was obtained in initial

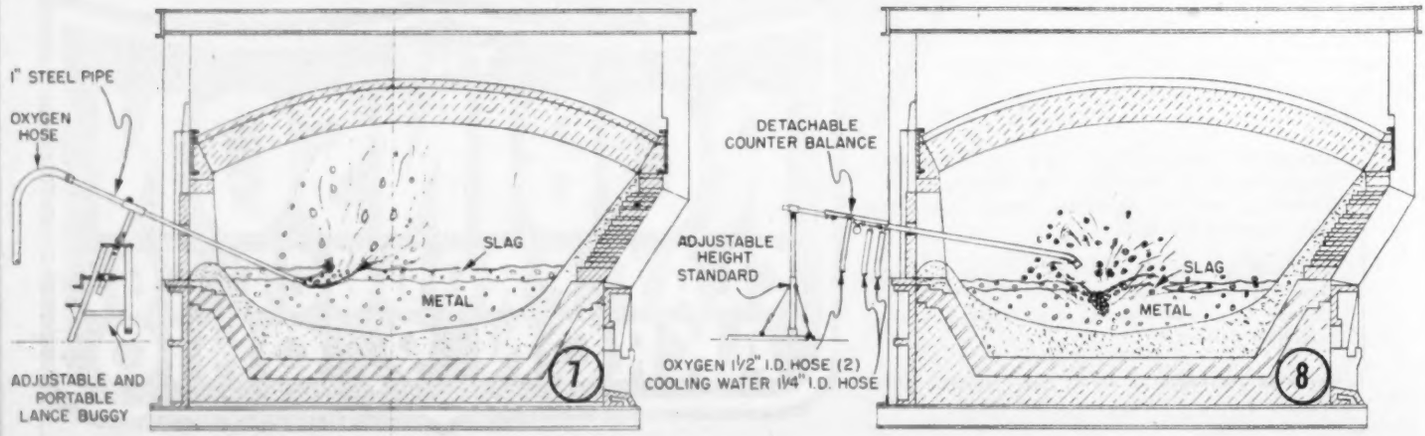
*Fig. 5—Firing end of main burners. (A) Removable fuel pipe, (B) exchangeable oxygen nozzle*

*Fig. 6—Side view of open-hearth main burners designed with fuel, oxygen and cooling water connections*

*Fig. 7—Lance mounted on buggy playing oxygen on metal bath*

*Fig. 8 — Jet device which directs oxygen through slag and into metal*




[1] $4C+Fe_3O_4 \rightarrow 4CO+3Fe$ —heat

work, difficulties still exist because of the necessity of interrupting injection to replace pipe, hose interference with charging practice, temporary scarcity of steel pipe, and cleaning pipe for oxygen service.

In addition to these difficulties there is some reason to believe that lance oxygen injection as now practiced is not as effective as oxygen injected beneath the metal surface. Larger quantities of smoke are produced and splashing is increased with attendant danger to roof and wall refractories.

The jet device is usually placed in the furnace so that it is approximately 3 to 6 in. above the surface of the slag. The oxygen blown into the melt pushes the slag back and reacts with the metal below, causing violent agitation of the bath. This reaction is accompanied by the evolution of large quantities of brown fumes consisting of iron oxide, manganese oxide, and calcium silicates.

While the injection continues, the bath begins to boil and bubble over its entire surface due to the rapid formation of large quantities of carbon monoxide shortly after the beginning of the oxygen injection. The slag becomes foamy as in a rapid ore boil, and frequently overflows the door banks unless they are built higher than usual. As the refining progresses, the slag level gradually subsides and the bath temperature rises. Heat input from the main burners is reduced from about one-half normal fuel flow at the start of oxygen injection to zero as the bath and furnace gain temperature. By the time a low-carbon composition desired for tapping is reached, the bath is comparatively quiet, with small bubbles scattered generally over the bath.

Recommended nozzle pressure for operation of a jet device is 100 lb. Smoke is minimized at this pressure.

A number of benefits may result from the injection of oxygen into the molten bath:

1. Shortening of the period required for reduction of carbon content.
2. Rise in temperature accompanying carbon removal.
3. Saving of fuel in addition to that proportional to reduction in heat time because fuel input is generally reduced during injection.
4. Closer and more flexible furnace control and higher bath temperatures than customary may be attained in the open hearth.
5. Because of the heating action of oxygen, a combination of ore and oxygen can be used to effect rapid and economical decarburization.
6. Marked reduction in the quantity of limestone required for production of heats in which a high percentage of hot metal is charged.

*Fig. 9 — View of molten steel while oxygen is being directed at the bath through jet device*

7. Steel quality is not affected adversely.
8. Improvement in sulphur elimination is also claimed, most probably as a result of high bath temperatures and enhanced agitation.

Additional comparison between lance and jet operation was secured by selecting heats on the basis of a carbon reduction rate of about 1 point per min. Averaged data shown in Table II were obtained on heats with initial carbon content averaging about 75 points in a 225-ton furnace.

The tabulated information shows that a reasonable improvement in production was secured with lance and jet oxygen injection. The rate of oxygen injection through the lance was approximately double that through the jet device; however, the rate of carbon reduction with the lance was only about 30 per cent higher.

Particular conditions existing in an individual shop will determine to a large extent whether oxygen should be employed. It is believed that oxygen can be used in open-hearth practice to increase output of almost any shop. This increase in production may obviate the necessity of constructing new open hearths. Where production increases of 20 to 40 per cent have been experienced, conversion to oxygen practice in 3 to 5 open hearths would increase steel output by the same amount as construction of a new open hearth furnace.

Use of oxygen through burners and

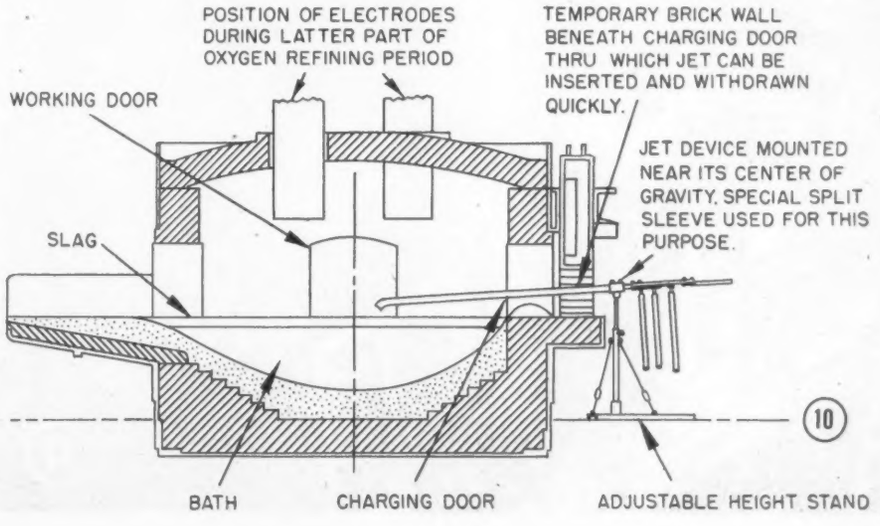

POSITION OF ELECTRODES DURING LATTER PART OF OXYGEN REFINING PERIOD
TEMPORARY BRICK WALL BENEATH CHARGING DOOR THRU WHICH JET CAN BE INSERTED AND WITHDRAWN QUICKLY.
WORKING DOOR
JET DEVICE MOUNTED NEAR ITS CENTER OF GRAVITY. SPECIAL SPLIT SLEEVE USED FOR THIS PURPOSE.
SLAG
10
BATH
CHARGING DOOR
ADJUSTABLE HEIGHT STAND

*Fig. 10—Cross section of electric furnace with jet installation*

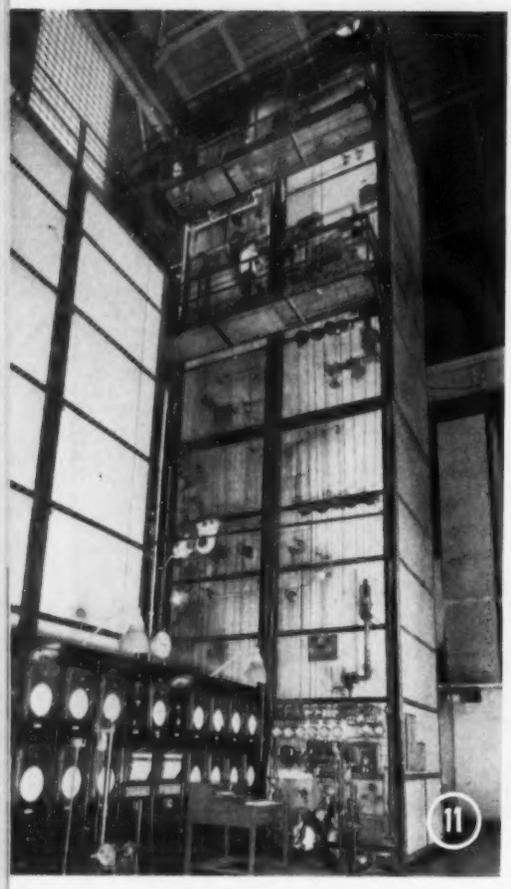


*Fig. 11—Bank of steam-driven 4-stage air compressors*

*Fig. 12—Oxygen producing unit with capacity of 150,000 cu ft of 99.5 per cent liquid oxygen per hour*

directed onto preheated scrap to accelerate charge meltdown is most effective for shops which use 35 per cent or more cold scrap, and for shops which contain relatively old inefficient furnaces.

Injection of oxygen into the bath is most useful in shops employing large amounts of hot metal in the charge, and in shops which produce low-carbon steel. When large amounts of carbon must be removed quickly from the bath, oxygen injection in the bath is advantageous. Maximum benefit from oxygen, in some cases, may require utilization of oxygen for both meltdown and for refining during the processing of a single heat.

The desirability of using oxygen in the checkers and in auxiliary burners has not yet been definitely established.

Enough campaigns have not been run to determine the effect upon the life of refractories. Experience to date has indicated that life of refractories will not be adversely affected if burners are used properly. Lance injection of large quantities of oxygen in a few hot metal shops has impaired the life of roof refractories, in some shops causing as much as 30 per cent decrease in this life. Most of the trouble results from slagging the roof with quantities of molten iron and slag thrown onto the roof by the extremely vigorous splashing caused by lance injection. Because of the nature of the trouble, considerable improvement in roof life has been secured by increasing the effective roof height and taking care to direct as much splashing as possible away from the roof. Use of two lances in place of one would be expected to lengthen roof life materially by reducing the amount of splashing. High velocity jet injection has repeatedly produced much less smoke and splash than lance injection of similar oxygen flow rates.

Production of large quantities of smoke during refining with oxygen injection and charge melting by directing oxygen at preheated scrap constitutes one of the major problems of oxygen use. Considerable success in smoke elimination has been achieved by the installation of simple dust collectors in the flue system and by charging checker construction to provide additional gas space. Further improvement results from more frequent checker blowing with changes in blowing procedure to improve dust removal. Improved methods of oxygen injection which cause less formation within the open hearth proper will lead to further reduction in smoke.

It is essential that scrap charging facilities be adequate if full efficiency is to be obtained from use of oxygen during meltdown. Otherwise, the entire value of accelerated meltdown can be more than counterbalanced by delays in furnace charging. When charging is accomplished as fast as permitted by rate of meltdown, the increased charging rate is indicative of the potential benefits from oxygen, as follows:

| Burner oxygen flow, cu ft/min | Charging rate, tons/hr |
|---|---|
| 0 | 52.5 |
| 825 | 82.0 |

In order to keep up with the rapid meltdown rate secured at high rates of oxygen flow, it was necessary to provide the services of two charging machines, and to neglect the other furnaces in the shop during the test periods. The limiting factor in rate of meltdown therefore appears to be the charging rate.

Increase of open hearth production to be of value must be countered by adequate facilities for processing increased production in rolling mills at the particular mill, unless surplus ingots or blooms can be sold to shops containing inadequate steel producing units. It also might be of value to produce the same amount of steel from a lesser number of furnaces.

**Oxygen Purity:** Practically all of the experimental work thus far performed with oxygen in the open hearth and electric furnaces has been with oxygen of 99.5 per cent purity, the standard commercial product, because oxygen of this purity is so much more readily available and convenient to use than oxygen of lower purity or even than compressed air. As a matter of fact, compressed air or low-purity oxygen in the quantities and at the pressures

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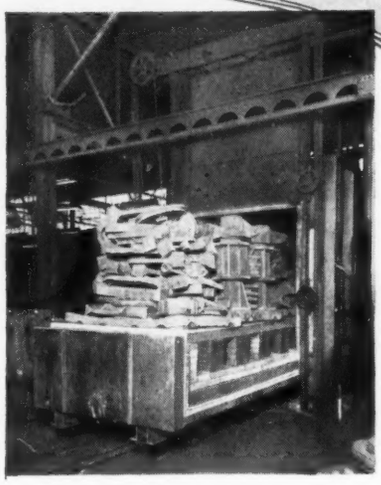
Furnace relined with B&W Insulating Firebrick: Sidewalls and end—9" B&W K-26 I.F.B. backed with 4½" B&W K-16 I.F.B.; Arch—9" B&W K-26 I.F.B. backed with 2½" B&W K-16 I.F.B. Car lined with 8" B&W K-22 Insulating Concrete, topped with B&W Junior Firebrick.



"Just like adding a new furnace," was the operator's comment when he saw the improvement in production and fuel efficiency obtained by relining his furnace with B&W Refractories.

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TABLE II—COMPARISON OF JET AND LANCE OPERATION

| | Jet Device | Pipe Lance |
|---|---|---|
| Type of steel | Low carbon | Low carbon |
| Heats averaged | 7 | 7 |
| Percentage increase in production | 10.3 | 6.9 |
| Oxygen injection rate, cu ft/hr | 22,200 | 46,700 |
| Oxygen consumption, cu ft/ton steel | 102 | 163 |
| Oxygen efficiency, cu ft/point carbon reduction/ton steel | 1.7 | 3.2 |
| Initial carbon, points | 77 | 72 |
| Final carbon, points | 18 | 16 |
| Carbon reduction | 59 | 56 |
| Rate of carbon reduction, points/min | 0.9 | 1.2 |
| Charge-to-tap time with oxygen, hr | 10.0 | 10.3 |
| Charge-to-tap time without oxygen, hr | 11 | 11 |
| Merit factor | 9 | 4 |

needed are not at the moment readily procurable at most open-hearth furnaces.

Many of the conclusions so far drawn as to the effect of pure oxygen, especially the economics, may be altered when the results on the performance of oxygen of lower purity and of compressed air have been ascertained. The Linde company has continuously emphasized this point and from the very beginning of open-hearth experimentation with oxygen has insisted that the results should be extended to the point of using compressed air for all operations where pure oxygen was tried, so as to get a true overall picture.

Early in the program a small amount of information was acquired with varying purities of oxygen obtained by mixing air in various quantities with the oxygen although the burners used were designed for operation with oxygen. While the end burner tests with varying purities were limited in number, results indicated that 75 per cent purity oxygen was almost as effective in improving the meltdown speed as oxygen of 99.5 per cent purity when the same volume of contained oxygen passed through the burner. It should be pointed out, however, that when low-purity oxygen as well as compressed air is used in the end burners, a greater quantity of combustion gases passes over the bath, which tends to increase the "blow," and thus the amount of dust collecting in the checkers.

No experiments have been conducted yet with compressed air or lower purity oxygen in the scrap meltdown by directing a jet directly on the hot scrap. Since this operation involves rapid oxidation at high temperatures, it is to be expected that air would not be effective. On the other hand, some purity slightly below 99.5 per cent might be substantially as effective as the high-purity oxygen. It might be noted, however, that the lower the purity of the oxygen, the greater would be the tendency for dilution by the furnace atmosphere. Preliminary results were obtained with 90 per cent oxygen which showed that the results were substantially the same as with 99.5 per cent oxygen. A few preliminary data have already been obtained with air injection and the rates of drop of carbon content were between those obtained by normal practice and those resulting from use of 99.5 per cent oxygen. However, these experiments are only in the beginning stage. Because of the larger volume of gas which must be blown through lances or jets when compressed air is employed in order to procure the same total quantity of oxygen in the bath, the technique of lance or jet injection may have to be modified in order to obtain the equivalent oxidizing action at comparable speeds. Tests to date have not been sufficiently extensive to determine the relation between rate of blowing and speed of decarburizing.

Further experimental evidence must be obtained before the optimum oxygen purity can be determined. For example, the following must be considered:

1. The relative heat effect obtained by injecting various mixtures of nitrogen and oxygen (from 21 to 99.5 per cent oxygen) will govern the quantity of ore which can be added during the working period, and will also affect the fuel consumption during this period. One advantage of injection of oxygen is to compensate for the cooling effect of ore additions, thus permitting the use of larger ore additions than normally. Furthermore, oxygen can be used to produce a rapid rise in temperature when needed. Both of these functions will be affected by the oxygen purity.
2. The possibility that certain steels may be injured by exposure to mixtures containing high concentrations of nitrogen needs to be investigated. Preliminary tests have indicated that air injection did not produce higher than normal nitrogen concentrations in the steels.
3. Preliminary results so far obtained show that when air is fed through lance pipes or jets in quantities comparable to those employed with high-purity oxygen, there is a good deal more splashing of the slag, thus causing more refractory damage. Improvements in technique may reduce this damage.

The whole performance and economic picture of the use of oxygen in the open hearth is affected largely by the purity of the oxygen employed. It is of vital importance that this factor be given major emphasis in experimental work at open hearths in the immediate future.

Varying purities of oxygen, including compressed air must also be tried at electric furnaces, particularly in stainless steel manufacture. It is possible that the nitrogen content of the air may affect certain stainless steels. However the conclusion that it would be profitable to use only oxygen of high purity in manufacture of stainless steels should not be drawn without further extensive tests. These tests are already scheduled.

Use of oxygen injection for carbon removal has become standard practice in some electric furnace shops. A typical installation for the experimental use of the jet device is shown in Fig. 10.

In normal practice a steel lance is inserted into the bath until the end of the pipe is located at the interface between the metal and the slag, a method requiring several 20-ft lengths of pipe per heat.

During jet device oxygen injection, the equipment is inserted into the furnace until the nozzle is pointed at the deepest portion of the bath with the tip of the head held from 3 to 6 in. above the slag surface. Generally, this means that the jet is located between the electrodes, with the oxygen stream directed away from the electrodes to minimize electrode oxidation. None of the tests to date has shown any increase in electrode consumption beyond normal practice. Both the jet and the lance are left in one location for the duration of the carbon removal period, after which they are moved to permit normal deoxidizing or processing of the melt.

Most of the oxygen used to date in electric furnaces has been injected into either straight low-carbon steels, or high-chrome steels, where some chromium has been included in the charge. Results of a number of heats with lances and jets in 30 to 70-ton electric furnaces indicate that carbon reduction rates of 0.5 point per min for chrome steels are readily achieved, and that carbon reduction rates of 1.0 point per min, or better, are possible when treating plain low-carbon steels. Considerable savings in power consumption are common.

A summary of results obtained with oxygen injection in electric furnaces is given in Table III.

The chief disadvantage associated with the use of oxygen injection in the electric furnace appears to lie in the nuisance value of the excess smoke created, although most shops do not find this a real objection. A minor disadvantage in chromium steel heats is the refractory chrome oxide buildup on the end of the jet requiring removal either by sledging the deposit after it has cooled, or by fluxing it down to small weight while in the furnace.

Benefits derived from use of oxygen are:

1. Charges can be melted and superheated faster.
2. Time for carbon reduction can be

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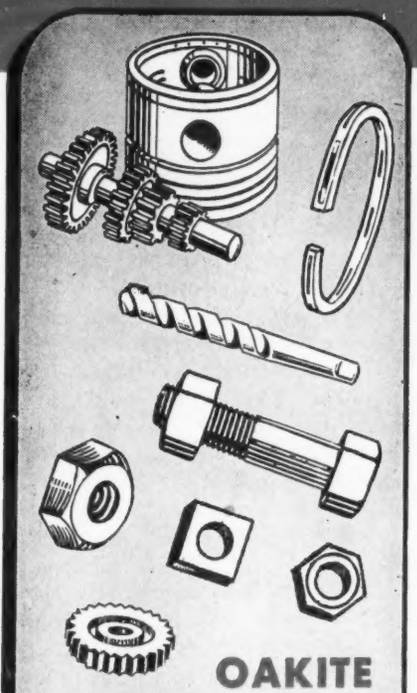

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TABLE III—SUMMARY OF RESULTS WITH OXYGEN IN ELECTRIC FURNACES

| Plant | Jets L | Jets F | Jets K | Lances F |
|---|---|---|---|---|
| Type of steel | Alloy | Alloy | Low Carbon | Alloy |
| Size of heats, tons | 33 | 71 | 77 | 68 |
| No. of heats averaged | 7 | 1 | 13 | 6 |
| **Production** | | | | |
| Tons per hr with $O_2$ | 4.1 | ... | 10.3 | ... |
| Tons per hr without $O_2$ | 4.4 | ... | 9.1 | ... |
| Per cent increase | 7.3 | ... | 13.2 | ... |
| **Oxygen Data** | | | | |
| Injection rate, cfh. | 16,700 | 13,300 | 25,200 | 21,500 |
| Operating time, min | 35 | 244 | 34 | 172 |
| Operating pressure, psi | 85–95 | 62–70 | | |
| Consumption in cf/ton | 296 | 764 | 175 | 908 |
| Consumption in cf/point/ton | 18 | 6.2 | 5.2 | 16 |
| **Carbon Data** | | | | |
| Initial carbon points | 21 | 130 | 58 | ... |
| Final carbon points | 5 | 6.5 | 22.6 | |
| Carbon reduction points | 16 | 123.5 | 35.4 | 57 |
| Carbon reduction in points/min | 0.40 | 0.5 | 1.05 | 0.33 |
| Charge to tap time with $O_2$ | 7.5 | ... | 7.5 | ... |
| Charge to tap time without $O_2$ | 8.0 | ... | 8.5 | ... |
| Merit factor | 2.1 | ... | 6.3 | ... |
| **Power Data** | | | | |
| KWH used/ton without $O_2$ | 970 | ... | 615 | ... |
| KWH used/ton with $O_2$ | 785 | ... | 510 | ... |
| Total power saved, % | 19 | ... | 17 | ... |

appreciably shortened.

3. Melt can be processed with 15 to 20 per cent less power through reduction of heat time.
4. With close control of temperature made possible by the use of oxygen, the amount of desirable metal values lost to the slag should be reduced.

The Linde company's Driox liquid oxygen production and distribution system has made available sufficient oxygen to carry on experimental work at practically all open-hearth shops. The primary feature of this distribution system is that oxygen in quantities adequate for the need can be transported in liquid form from the producing plant to the user in railroad tank cars that have capacities of 750,000 or 1,000,000 cu ft (gaseous equivalent at normal temperature and pressure). This meant an uninterrupted supply of the large volumes of oxygen necessary, without any particular investment for capital equipment. Present storage and conversion equipment had ample reserve capacity. In a few cases, some extensions of pipe lines to the open-hearth floor were made, although many furnaces were already piped with oxygen for such operations as opening tap holes.

Where demands are from 50,000 cu ft (2 tons) to about 750,000 cu ft (31 tons) per month, the so-called "Cascade" oxygen system is used. In this system the liquid oxygen is brought to the storage point as a liquid in a tank truck. At that point it is converted by equipment on the truck into gaseous form and charged into receiver tubes on the user's property. Here again, the oxygen is then conveyed from the Cascade oxygen tubes to the use points through a pipe line system. The desired pressure and rate of flow is maintained by automatic, pressure-regulating valves.

At the present writing, it is clear that the overall experience with the use of oxygen in the open hearth or for other metallurgical uses is still limited, and much has to be learned in terms of proper practice, techniques and ultimate economics.

If it should appear that the future demands for metallurgical oxygen will be such that the present Driox oxygen system cannot meet the requirements in terms of volume, or is uneconomical, it may well be that individual gaseous oxygen plants of large capacity may have to be installed at certain specified locations.

As yet the extent of the future demands for oxygen which may come from new metallurgical uses of oxygen is uncertain. Before a steel mill will be in a position to formulate the specifications for large capacity gaseous oxygen plant, the answers to the following questions must be known:

1. What metallurgical uses of oxygen are economically attractive?
2. What quantities of oxygen are going to be needed?
3. How will oxygen demand vary?
4. What oxygen purity will result in the greatest overall economy?
5. To what extent must the continuity of supply be assured?
6. What pressure must be maintained in the oxygen pipeline?

Answers to these questions are being obtained by means of the large capacity gaseous oxygen plant development program of the Linde company and by close co-operation on trials of use of oxygen in many open-hearth shops. This program embraces the design, operation and testing of a pilot-size large capacity gaseous oxygen plant, investigation of the uses for oxygen in the metallurgical industries, study of the oxygen demand characteristics of metallurgical processes, and determination of the physical conditions under which large capacity gaseous oxygen plants on customers' property will have to operate.

## Export Shipping To Require Better Packaging Methods

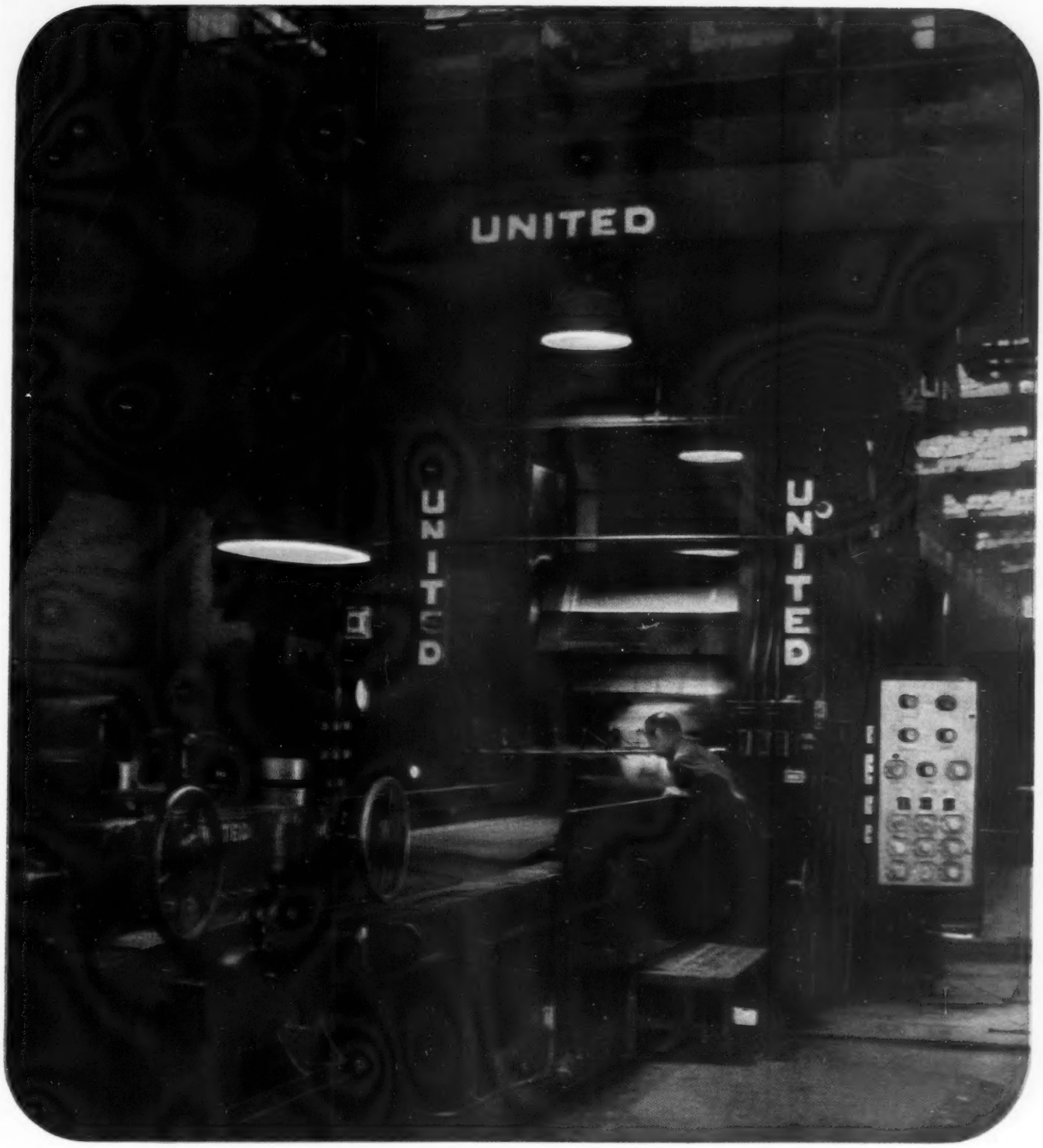
More attention will have to be paid to our export packaging and merchandise will have to be provided with sturdy, serviceable and economical packages if the United States is to retain the edge on export business it now enjoys. At the present time international competition is not so keen in certain lines of merchandise, but as it increases, packaging, now said to be up to 99 per cent improperly done, will have to be improved. This is the opinion of E. C. Barker, chief field engineer—sales, Gerrard Steel Strapping Co., Chicago, expressed before the world trade committee of the Rochester, N. Y., Chamber of Commerce recently.

The packaging engineer would be aided considerably if the shipping department would advise him, if possible, of the type of handling at the overseas port, the port facilities such as docks, warehouses, etc., routing and method of transportation inland from the port to the ultimate destination. This would enable him to effect certain economies if conditions are favorable, or if conditions are unfavorable, he may be able to save the entire shipment from damage.

Consideration of the principal hazards encountered in overseas shipments should be made by the packaging engineer. These are: The number of times the packages must be handled, from factory to vessel and from vessel to ultimate destination; pressures exerted by other cargo in the hold of the vessel; changes in atmospheric conditions causing condensation or sweat on or within the package or exposure to rain during loading, unloading or storage; opening of the packages by customs officials; theft and pilferage.

The speaker went on to recommend that the sheathed crate designs be retained by exporters of large and heavy machinery and equipment. He also stated that wire-bound, cleated plywood and nailed wooden boxes should be used for overseas use.

Strapping is a versatile and inexpensive method for adding strength and rigidity to a container as well as preventing pilferage, he stated. Strapping of wooden containers should be delayed, it was reported, until ready to ship, so as to avoid the loose strapping coming from the shrinkage of container lumber during the storage period.

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## Controlling Parts Flow

(*Concluded from Page 67*)

cards for standard parts and new work production cards, Fig. 2, are issued to the shop, also orders for steel, castings, forgings or purchased finished parts are sent out. Instructions for sending patterns out to the foundry also come from this department.

Most of the information required on the forms is self-explanatory. However, several points require some clarification. The balance column of the manufacturing order, Fig. 4, is the actual quantity to make. Production card number is the number of the master card, Fig. 2.

The "to be worked on" columns of the manufacturing order, Fig. 4, are headed with all the types of machining performed. As the sequence of the operations is carried out and completed, a sequence number is put in the square. If the company has no operational setup this record will help planning to obtain the sequence, saving a lot of "chasing"; probably a more efficient detail may be set up; if the original is good then just a few inquiries can set the records straight.

Once the sequences have been determined it will be easy to issue all the production cards directly from the production office, stating size of sub batches also. This card, properly completed, helps in following progress of the work and ties in with the progress follow up board to be described later.

Using a bearing as an example, the following procedure would be followed in putting this system to work: The order is for 100 complete bearings, but against expectancy of further sales we will issue an order for 2000. The extra 1000 will be put in finished parts stores unassembled.

First job is to check steel stock and any purchased finished parts. If there is no steel in stock it must be ordered immediately; three sizes of steel are needed for the job and one size of balls. Inventory cards are brought up to date. It is also necessary to cross index this steel with other inventory cards to determine on what other parts steel could be used. We now make out manufacturing orders and issue them to the various operating and shipping departments involved.

The master production cards are put in the allotted sections on the progress planning and control board, Fig. 1. The department starting the first operation on the parts makes out a branch batch card. It should be clearly understood that there are many ways to handle branch batch cards, particularly if it is desired to start the next operation before all the parts have had the previous operation done on them; in this case it is better to make out branch batch cards for each master card. It is easy to give the branch batch card to the operator and still have the master card in the progress control board.

After departments have completed the work they have to do, the parts are inspected and then shipped to finished parts stores. Department No. 9, Fig. 4, now draws out of finished parts stores as many parts as will complete the assemblies ordered, using production card, Fig. 3. The parts are now shipped to shipping stores department No. 3 which then ships the assemblies to the customer. In comprehending this system it is important to understand the difference between process stores, finished parts and shipping stores.

### Steel for Specific Job

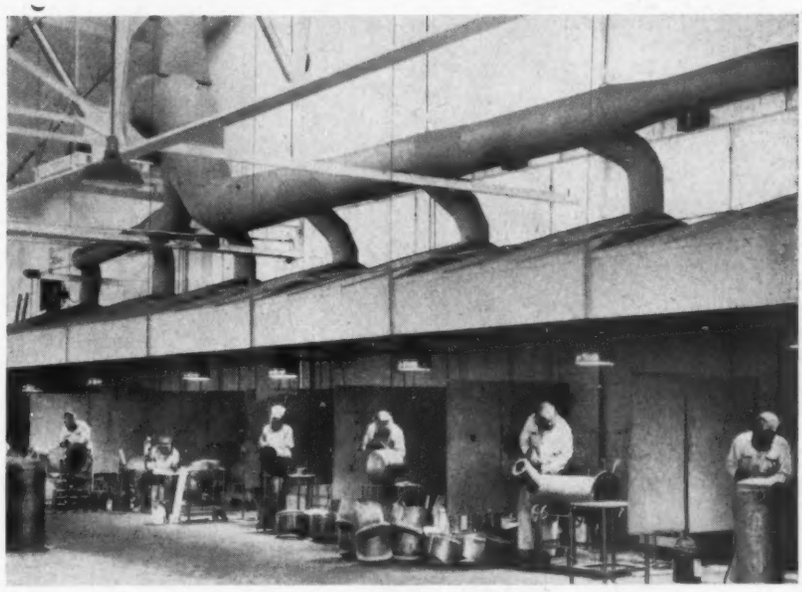
It is extremely important to make sure that steel bought for a job is used for that job and that steel storage department works closely with the inventory card section and the manufacturing order release section of the production department.

For subassemblies and final assemblies as with the individual parts a master production card, Fig. 2, is issued along with the manufacturing order, Fig. 4. These are used by the assembly department in the same manner as for individual parts and also as authority to obtain the parts from finished stores. When the parts have been taken for assembly purposes they are checked off the parts inventory card.

Now that they are known as subassemblies and final assemblies the parts are sent to "shipping stores" and the quantity assembled is entered up on a modified inventory card. The only information needed on this modified inventory card is how many parts (subassemblies or final assemblies) are put up. Special parts are treated in a like manner to the standard parts, except that it is the responsibility of the engineering department to issue prints before the production and planning department can proceed with work.

Note also the visible rough cross-checking of machine load, particularly with the number of cards in each section of the progress planning control board. In many shops standard parts are used along with special parts; at the same time 80 per cent more or less may be in production. If such jobs as these are not broken down by the engineering and production departments it means that many parts or pieces of steel are used and the inventory cards never show a true balance.

Therefore shipping lists should be carefully checked off by the production department, making sure that the parts needed are taken off the steel inventory cards or the parts inventory cards. In these the shipping list is the authority to obtain parts from finished stores or shipping stores. Actually in practice some parts never see finished stores or shipping stores, but the paperwork must.



**WELDING BOOTHS DELUXE: One of the most modern welding booth systems is this one at Erie Meter Systems Inc., Erie, Pa. Each booth is equipped with an individual exhaust outlet which is controlled by the operator. Large light in each booth is strong enough to permit operator to see the outlines of the piece on which he is working even though his shield is down. Photo courtesy Lincoln Electric Co.**

## Industrial Lighting Costs

(*Continued from Page 70*)

in (B) above, and estimating the cost of cleaning the two reflectors at 50 cents per outlet, then the installation should be cleaned about every 4 months.

Following formula was used for calculating the effect of cleaning on cost of light:

Overall annual cost per unit of light for any one set of conditions can be worked out in accordance with the following formula. By using various intervals between cleanings (T) the minimum cost per unit quantity of light can be obtained and thereby the optimum interval determined.

Relative annual cost per unit quantity of light =

$$\frac{C_b\left(C_c \times \frac{12)}{T}\right.}{1.00 - \frac{(RT^\circ)}{(200)}}$$

Where:

$C_b$ = Basic annual cost of light including owning, energy and lamp costs, as in text.

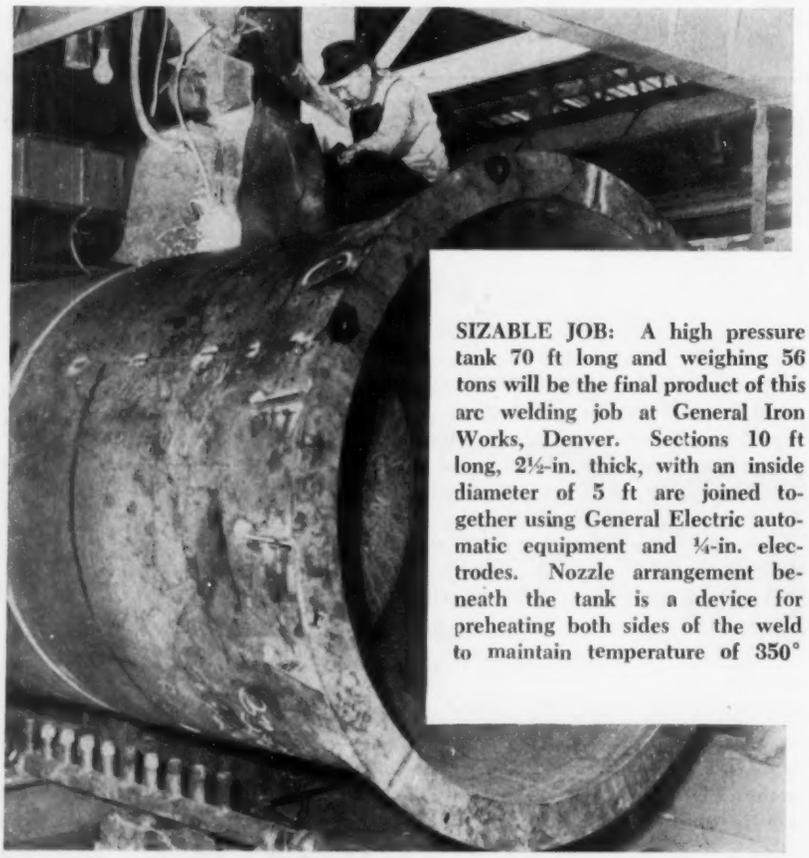
$C_c$ = Cost of one cleaning.

R = Monthly rate of depreciation in per cent due to dirt collection only.

T = Period between cleaning in months.

*One-hundred per cent light output is considered the average light output of new and old lamps in clean equipment. It will be noted that the expression RT over 200 indicated the average (straight-line) depreciation in light output due to dirt collection. While the exact form of the depreciation curve has not been determined, it should logically be an exponential function rather than a straight-line function. However, for the relatively short periods of time (1-6 months) that this analysis indicates to be critical cleaning periods for minimum overall cost of light, the difference between the two curves is slight.

**Lamp Outages:** Industrial experience has indicated that "service life" of a fluorescent lamp is in general at least a year regardless of one-shift or two-shift operations on the basis of the effect that "burning hours per start" has on life. This means that in a 1000-lamp installation 1000 lamps will be replaced each year, or approximately 80 per month. The small filament-type cathode at each end of a fluorescent lamp is coated with an active compound to aid in emission of electrons during starting and operation. This material is gradually used up during life of the lamp and is especially so during starting. Therefore, the life of the lamp is determined not only by the hours of use but also by the number of times it is started. Rated life is given in terms of "burning hours per start".



**SIZABLE JOB: A high pressure tank 70 ft long and weighing 56 tons will be the final product of this arc welding job at General Iron Works, Denver. Sections 10 ft long, 2½-in. thick, with an inside diameter of 5 ft are joined together using General Electric automatic equipment and ¼-in. electrodes. Nozzle arrangement beneath the tank is a device for preheating both sides of the weld to maintain temperature of 350°**

What procedure would prove most advantageous in replacing lamps?

Relamping may be done in either one or two general ways. First there is an "individual lamp replacement" method whereby each lamp as it burns out is replaced immediately or as soon as someone can get to it. This is the more expensive system and it gives better service from the standpoint of appearance of the system and the highest average lighting levels. At any given moment fewer lamps will be out.

Second is the replacement at periodic intervals of lamps which have failed in the intervening time. A supervisor inspects the lighting system once a week, or at some other specified interval, and sends maintenance men out to make replacements as noted. This reduces the lamp replacement cost materially. If the interval is too long, just before inspection there may be a high percentage of burnouts which affect not only appearance but also average footcandle level. Modification of the systems will be necessary according to the particular installation.

Many times a fine lighting installation is inaccessible from a practical standpoint. The location of machinery on the floor makes the use of maintenance devices difficult. The equipment itself may be so designed as to make relamping or cleaning difficult, or cranes may not be available when desired for maintenance of high bay areas.

Aids to maintenance should accordingly be considered at the time the original installation is in the planning state. If luminaires are at lower mountings, some type of ladder or relamping platform may be the answer. For higher mounting heights there is the possibility of catwalks, telescoping platforms, craneways, boom cranes, etc. Finally, ease of maintenance should be considered in selection of lighting equipment and its installation.

**Maintenance Program:** It is recognized that a particular plant presents conditions and procedures not in all respects identical with those indicated above, but a planned program is the basic step to getting the most for the lighting dollar. The following discussion outlines the information necessary to planning a maintenance program for either one or two-shift operation.

Fig. 11 shows graphically the effect of dust and dirt collection on lamps and reflectors in percentage of light output with reference to the annual hours of operation for one-shift or two-shift. On the basis of 2500 hours operation per year, with about two starts per day, the service life of the 40-w fluorescent lamp will be at least 2500 hours. The average lumen output of the lamps will, through

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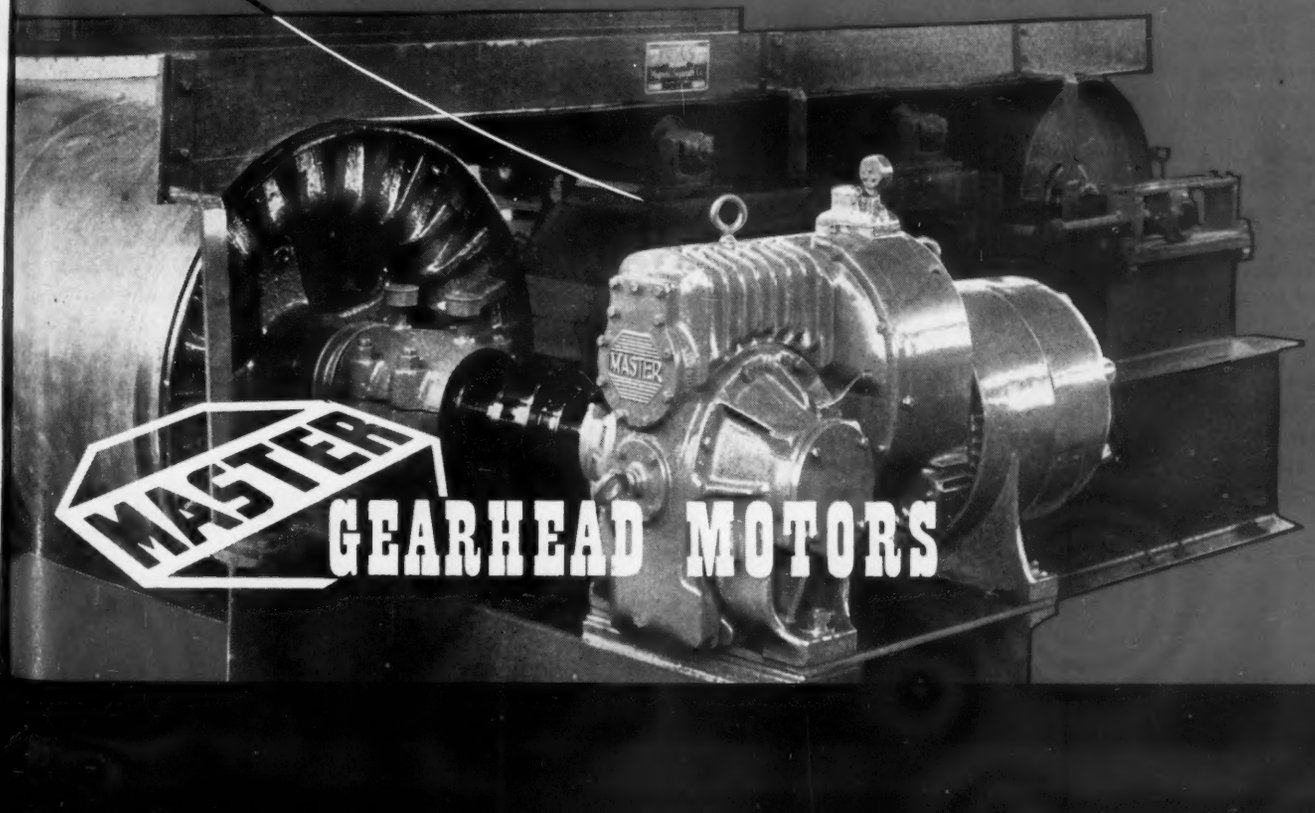


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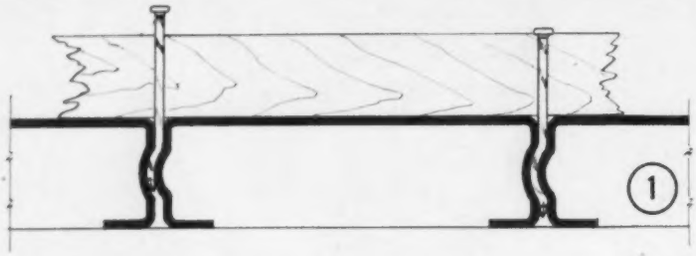


# Driving Nails In Steel Flooring

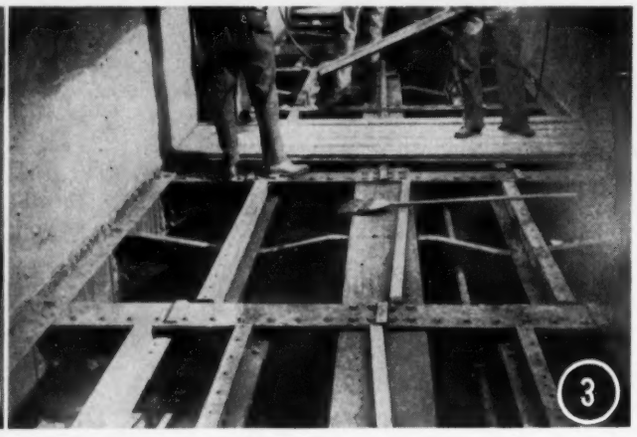
*simplifies freight-car and truck loading*

STEEL channels between which ordinary nails may be driven comprise the steel flooring designed to reduce maintenance costs for railway freight cars, trucks and trailers by Great Lakes Steel Corp., Detroit. Nails driven into the grooves formed by parallel flanges of curved steel are deformed, as shown in Fig. 1, holding securely, the company states.

Rolling stock so equipped can handle freight ordinarily secured by blocks nailed into place on wooden floors, but which needs replacing at frequent intervals, increasing maintenance costs and keeping equipment out of service. The 8-in. wide channels are formed of the company's N-A-X low-alloy, high tensile strength steel, laid across the width of the car or truck and welded to the underframes, with space left between the channels for the nailing grooves. A self-sealing composition with which the grooves are filled prevents loss of sand, grain or other bulk freight. Fig. 2 shows a piece of machinery being nailed to the floor of a trailer.

It is believed that hauling equipment having floors of this type will have more versatility as it permits handling of rough heavy freight, finished products or bulk materials, without time-consuming switching and assembling operation to supply cars with floors suitable for the particular commodity involved.

Nailable flooring is expected to last the life of the car (estimated at from 20 to 25 years) and stay in suitable condition for all types of freight throughout its life, it is reported. Greater structural strength of the steel channels offers the opportunity of designing new, lighter weight car underframes, although they may be installed as replacements in existing cars with little or no change in frame design as shown in Fig. 3.



the year, be of the order of 80 per cent of initial rated output.

Fig. 10 is developed by multiplying the per cent of the generated light that will get out of the reflector and lamps through the dirt and dust collection (Fig. 11) by the 80 per cent. These two factors can be combined to give a fair picture of the results that may be expected from a general lighting system.

Fig. 10 indicates the illumination value as affected by the two factors, lamp depreciation and collection of dirt and dust during the course of a year, in per cent of new lamp and clean reflector output with two cleanings per year. The dotted line indicates what would happen if the mid-year cleaning were omitted.

On the basis of 4000 hours operation per year with two to three starts per day, the service life of the 40 w fluorescent lamp will be around 4000 hours. The average lumen output of the lamps will be of the order of 75 per cent of initial rated output. Once again, by combining the two factors, the results that may be expected during the year may be pictured. Fig. 12 shows the illumination as affected by the two factors during the course of a year, in per cent of initial, with two cleanings per year. The dotted line indicates what would happen if the mid-year cleaning were omitted.

The 100-w fluorescent lamp has particular application in areas where higher mounting heights prevail; the foregoing data and these same recommendations will hold for this lamp. It should be pointed out that through planned lighting maintenance a large portion of the light which in the past has been lost but paid for, will be gained. Cleaning will require manhours; availability of labor will have bearing on what can be done.

Since dirt collection conditions do vary in different locations, illumination measurements should be made at least once a month in various areas in order that rate of depreciation due to dust and dirt can be established. This is the best way to keep a maintenance program checked and systematic. It is profitable to do this. Just as most industries today employ workmen who must see to do their work, it is worthwhile to avoid risking this ability by neglecting the illumination.

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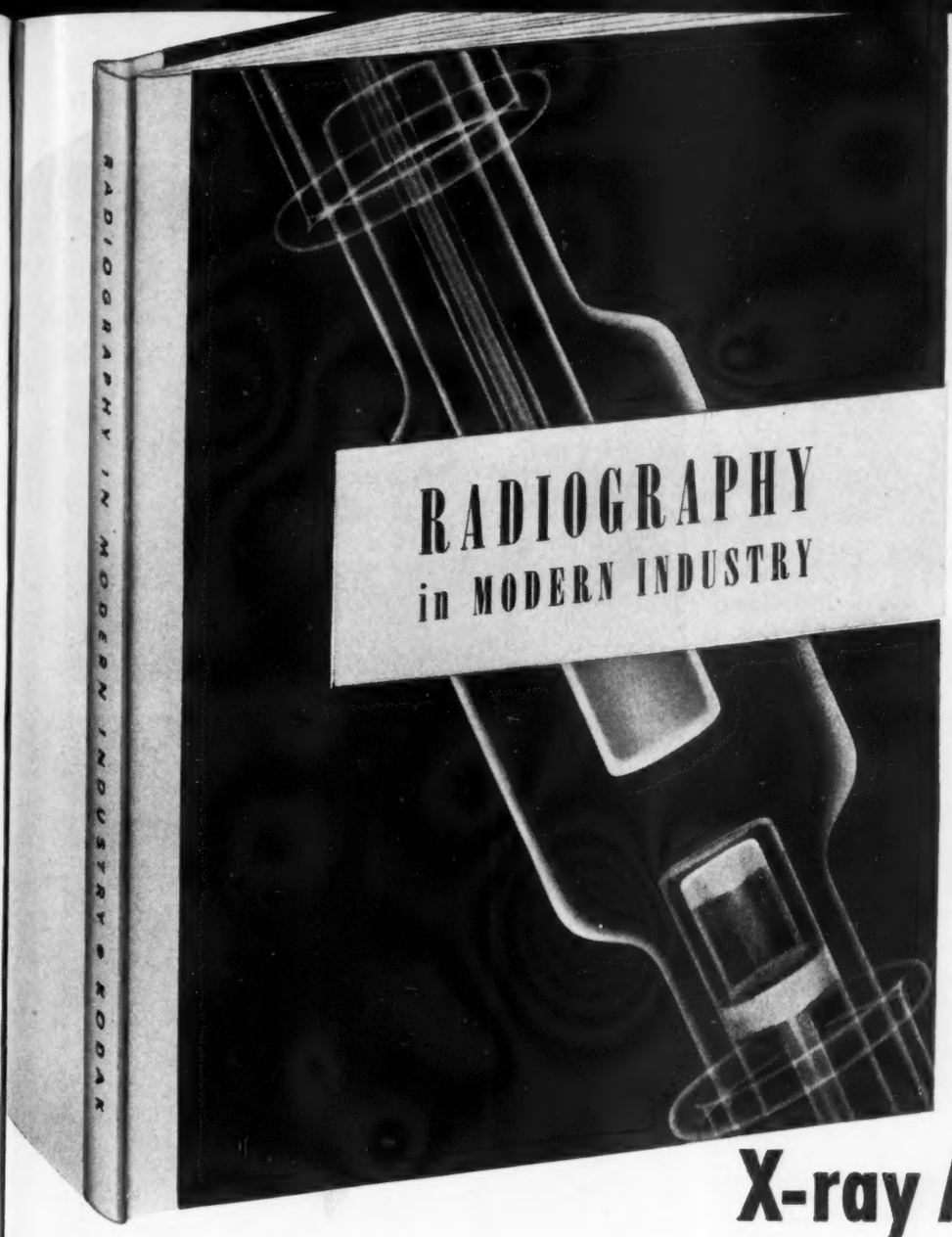


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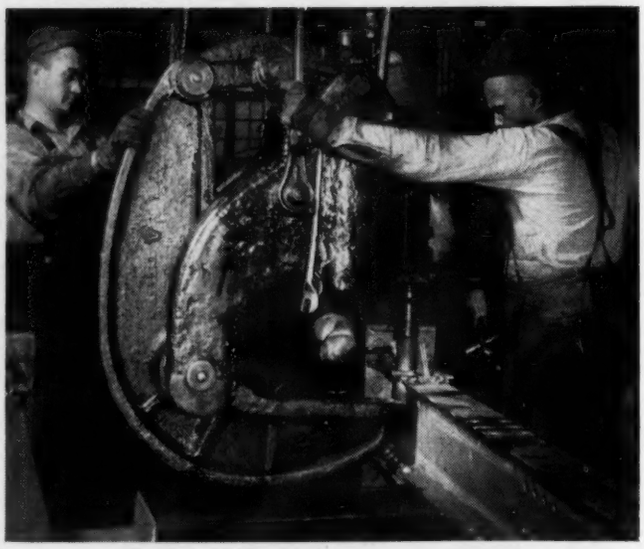

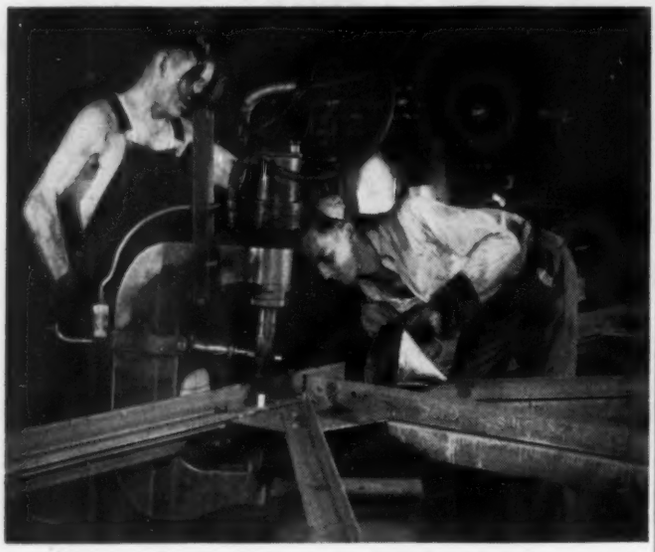

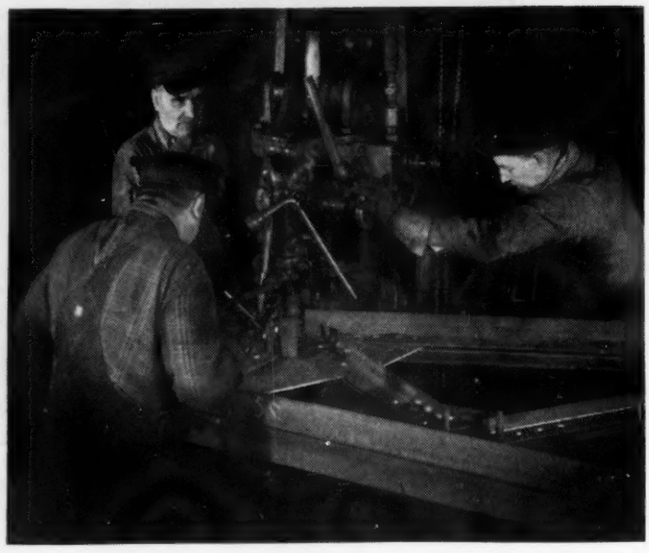

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## Magnesium Alloys

(*Concluded from Page 74*)

enough to make a complete removal advisable, a satisfactory paint and varnish remover of the waxless solvent type may be used. Burnishing the old surface is not recommended. Sandblasting may be used on castings and heavy sections but should be employed with care on thin sheets to avoid distortion. The chrome-pickle should be applied by the "brush-on" method to all areas of exposed metal. This technique consists of generous application of the following solution used freshly prepared:

Sodium Dichromate ($Na_2Cr_2O_7 \cdot 2H_2O$) ..... 1.5 lb
Nitric Acid (Conc. $HNO_3$, Sp.Gr· 1.42) ..... 1.5 pt
Water ..... to make 1.0 gal

The solution should be brushed on, allowed to remain about 1/2-min, and then washed off thoroughly with running water. Hot water, hot air or some other similar method of promoting drying should be used. When treating riveted or bolted assemblies, care should be taken to avoid entrapment of the solution in the joints. It is desirable to repaint the structure as soon as it is thoroughly dry.

REFERENCE

21. *Light Metal Age*, Nov., 1944, p. 20.

## Manual on Resistance Welding Revised by RWMA

Resistance welding knowledge recently acquired through scientific research is incorporated in the revised Resistance Welding Manual published by Resistance Welder Manufacturers' Association, Philadelphia.

The 544-page manual, the first edition of which contained the chapters on the subject from the handbook of the American Welding Society, has new information added in the form of contributions of authorities in the field, extracts of papers from competitions sponsored by the RWMA and reports on recommended practices, and on definitions completed by subcommittees of the AWS resistance welding committee.

## Press Speed Control Made Standard Equipment

The control feature which gives rapid ram speed for the approach portion of the ram stroke and regulative speed for the pressing portion of the Multipress, made by Denison Engineering Co., Columbus, O., has been made standard equipment. Raising the hand levers of this Multi-Speed control slightly and momentarily at any point in their downward travel results in a changed ram speed for the remainder of the stroke.

# Metal-Clad Wall Material

### . . . expected to reduce construction costs on large multistory buildings

NEW metal-clad insulated wall material which gives promise of many new economies in the construction of multistory apartment houses, offices, factories and even private homes was given its first public showing in New York early this month. Still in the experimental stage, each wall unit is essentially a sandwich type material having an exterior facing of steel, a core of insulation such as Foamglas, and an interior facing of steel.

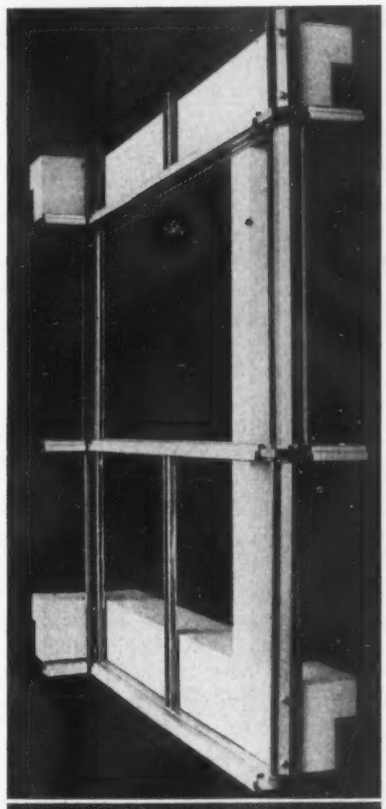
Metal parts of the unit are made and formed with standard sheet metal-working equipment. Bonding of the Foamglas core involves the use of simple presses and equipment. Applied to the skeleton building frame the wall material can be erected without use of concrete or other bonding agent.

Each of the 3½-in. thick wall units measures 52 in. square, and weighs 200 lb. Two of them span from the ceiling of one floor to the ceiling of the next, so that on each floor the wall is divided horizontally into two parts. The lower half is a line of solid units bolted to the conventional reinforced concrete frame or steel frame of the building.

Upper half of the wall may be windows or solid wall in any proportion that the needs of a particular building may dictate. Flexibility, combined with its adaptability to current and tested methods of building frame construction, are two of the outstanding characteristics of this new building system.

Republic Steel and Pittsburgh Corning corporations engineered and fabricated several prototype units of the wall, using stainless steel and Foamglas, and included a complete ceiling-to-ceiling section of a multistory building. Other units of slightly different design were on display. They make use of copper, aluminum and stainless steel for outside surfaces, combined with Foamglas, microporite and vermiculite as insulating cores.

The exhibit at the Commodore hotel was sponsored by the New York Housing Trust, a privately-endowed, non-profit organization.



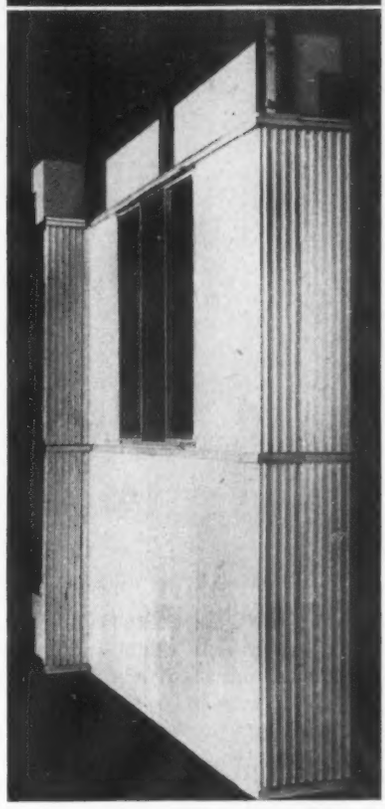


*Fig.* 1 (*top*)—*Continuous horizontal sill and head members attached to part of building skeleton*

*Fig.* 2 (*bottom*)—*Upper horizontal units in place with standard sash*

## Surface Machining

(*Continued from Page 65*)

textile machinery men who had seen the English machines. Be that as it may, it is a fact that by 1840 planer designs on both sides of the Atlantic had settled into a standard pattern which—for the double housing type machines—has come right down to 1947 fundamentally unchanged. It is in rigidity, power, cutting and return speed, and in convenience of operation, that the big planer improvements have occurred. Most of these have taken place since 1900.

In large measure they have been inspired by high speed steel, cast cutting materials such as Stellite and the carbides. In large measure they have been made possible by electrification. It is indeed a far cry from Clement's performance of less than one square foot per hour at very light cuts, to the modern performance depicted in the photograph in the heading of this article. This incidentally is just a run-of-the-mill job on a 3600 lb steel billet at the Warner & Swasey Co. The pendent switch in this case is typical of the convenience of electrical control.

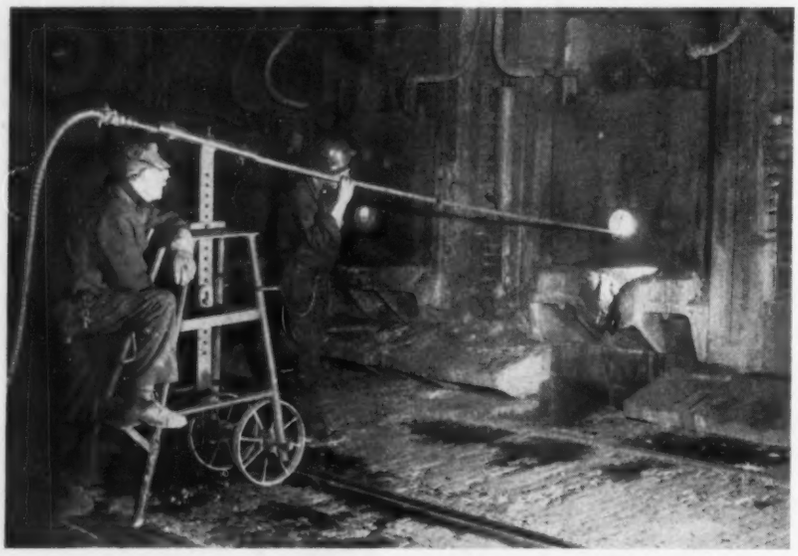
To give some idea of how far and how fast we have gone in electrical drive and control of machine tools, I present at the lower left hand corner of the two page spread at the beginning of this article a notable example of planer electrification in the early 1900s. This was an achievement of the G. A. Gray Co., Cincinnati. The machine itself was an advanced example of heavy duty planer building. The electrical system made use of the best ideas and finest equipment available at that time—including knife switches and rheostats such as were used on power station switch boards.

Regardless of how this aggregation may look now, it was a big step forward toward the compact and highly efficient electrified planers built by G. A. Gray and several other well known American machine tool builders today.

### Bold Pioneering Paid Well

If pioneering such as this had not been done, the electrical manufacturers would not have become as interested as they have in developing machine tool electrical apparatus, and our machine shops would not have reached the high state of efficiency that they now have attained. Machine tool electrification is a splendid example of industrial cooperation under our system of free enterprise.

In the development of the planer, it has been impossible to eliminate a certain amount of idle time due to the back stroke of the table. Years ago attempts were made to make these machines take cuts in both directions by reversing the tools. These so-called "Jim Crow" planers met with no great success and now have been almost completely forgotten.



**OPEN HEARTH OXYGEN: Oxygen for accelerating reduction of carbon is introduced into this open hearth furnace by a "lance" or length of steel pipe. Amount of oxygen required theoretically for reduction of carbon content by one point is 3.2 cu ft per ton of steel. Rate of carbon reduction achieved by normal ore practice averages about 0.5 points per minute. Using 100 to 300 cu ft of oxygen per ton of metal is said to increase the rate by factors of 3 to 5. Oxygen is also used to shorten melt-down period prior to refining. In some shops life of a 20-ft 1-in. pipe has been extended from several minutes to as long as 1.5 hours. For further details on use of oxygen in open hearths see STEEL, June 23, p. 107 and current issue, p. 86. Photo courtesy Jones & Laughlin Steel Corp.**

This problem has been met however, by greatly speeding up the return stroke —in some instances by reversing electrical drives similar to rolling mill drives. Considering the great combined weight of table and work which must be brought to a stop almost instantly from high speed, and sent even faster on the return, the performance is remarkable.

Anyone who is old enough to recall the agonizing screaming of slipping belts of the reversing mechanisms in planer departments in the days of belt drives—when speeds were very slow as compared to now—will be inclined to take off their hats to the mechanical and electrical engineers who have made possible the fast, powerful, efficient and quiet planers of today.

Another field in which tremendous strides have been made is that of the "open-side" design of planer with one housing and overhanging rail. Not so many years ago these machines were relatively flimsy and the only excuse for using them was because they would handle work too large to pass between the housings of ordinary planers.

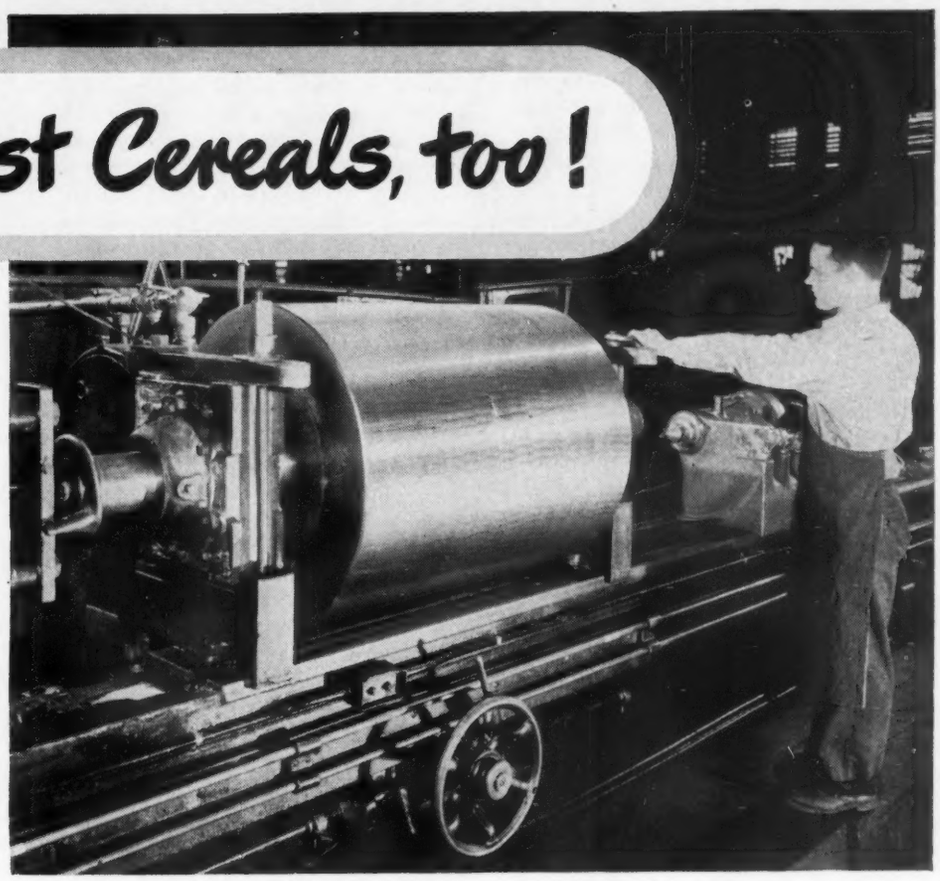
Today, like radial drills, these open-side machines have such amazing rigidity that they regularly are used as heavy duty machines on practically the same kind of work that is put on double housing planers. No longer are they considered special purpose machines. They do their daily stint along with the other planers, and at the same time stand ready to tackle oversize jobs with equal efficiency. In many planer departments a large number of the machines are of openside design purely because of convenience of operation.

There is too much tendency today to think of planers, as well as shapers and slotters, as "jobbing machines" rather than as production machines. A good way to get over that idea is to visit the plant of any major machine tool builder and there observe how planers and their "relatives" are made to earn their keep. It is true in many cases that their primary reason for being there is to machine beds, slides, etc., which could not be handled in any other way. However, when that work is done for the time being, they do not stand idle.

With the help of suitable fixtures, large collections of small details are "ganged up" on these planers and in that way their unit machining time is very small. A planer is too expensive a machine to have standing idle, and there is no excuse for having it stand idle.

Let your smart production men and your smart tool engineers get busy on this "ganging up" of work in the machine tool plant manner and they won't stand idle between "big" jobs. As a one-time machine tool man, I cannot

# Breakfast Cereals, too!



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recommend planers too strongly as effective production tools—when activated by the right kind of brains. If such was not the case, machine tools would cost much more than they do today.

The history of the shaper, which can be considered as a miniature planer in which tool instead of work travels, goes back at least to 1836 when the English engineer James Nasmyth introduced a machine long and popularly known as "Nasmyth's Steel Arm." Although shapers have been at various times eclipsed in popularity as production tools by milling machines, improvements in design have enabled them to hold their own—especially on work where extremely large numbers are not involved.

As indicated by the illustration of a battery of modern shapers at the center of the two-page spread at the beginning of this article, these machines are extremely convenient to operate on work which requires close supervision—including tool work done to scribed lines.

As in the planer, nonproductive time involved in the back stroke of the ram has been materially reduced in modern shapers. In some cases ingenious "quick return" mechanisms involving links and gears make this possible. In other cases it is accomplished hydraulically. It should be noted in passing that on small work the shaper is much faster than the planer because the dead weight which has to be moved is so much less.

Within recent years an "in between" class of machines called shaper-planers has won favorable attention. Hydraulic drive has been applied to these successfully and they have done much to hold popularity of single point tool machining on work which otherwise would call for special milling cutters. These machines, like modern planers, are designed to handle carbide tools.

In more or less the same category are vertical slotters—which actually are vertical shapers. These machines formerly were mostly of "walking beam" design and were used only for special work, including internal gear cutting. Several recent models are hydraulically operated, have angular adjustment for their rams, and indexed work tables. They are capable of fast, accurate, work on a wide variety of external as well as internal jobs. During the war they were widely used on breech mechanisms of large guns. As a result of that work they have gained new popularity on a wide variety of peacetime jobs. Like planers, they are indispensable on certain special work, but there is no excuse for allowing them to stand idle between such jobs.

As a tribute to those who continue to have faith in single point tool operations of the planer and shaper variety, I have reserved for the end of this article one of the real tidbits of that technique. The machine involved is shown at the lower right hand corner of the two-page picture spread. This is a special type of "draw cut" shaper designed and built by Morton Mfg. Co., Muskegon Heights, Mich., for machining curved blades of ship propellers. It is a good example of what can be accomplished when ingenious machine tool men and capable electrical engineers get their heads together.

When H. Earl Morton, the machine tool builder, and Oren G. Rutemiller, electrical engineer, discussed this machine at the Westinghouse Machine Tool Electrification Forum several years ago, they described its action as that of "cutting a screw thread with 20 ft pitch on an outside diameter of 15 ft and a root diameter of 3 ft." Incidentally, this machine is capable of rotary planing and milling, as well as draw cut shaping.

In the words of its designers, this machine illustrates the great possibilities and wide speed range of variable voltage drive as applied to machine tool feed and traverse motions. Motion of the saddle of this machine in a vertical direction and rotary motion of its table are so synchronized that the straight draw cut of the ram causes the tool to follow the true curve of the blade by narrow increments, thus generating the working surface by a series of reciprocating cuts. Little or no hand finishing is necessary and the finished curves are theoretically correct.

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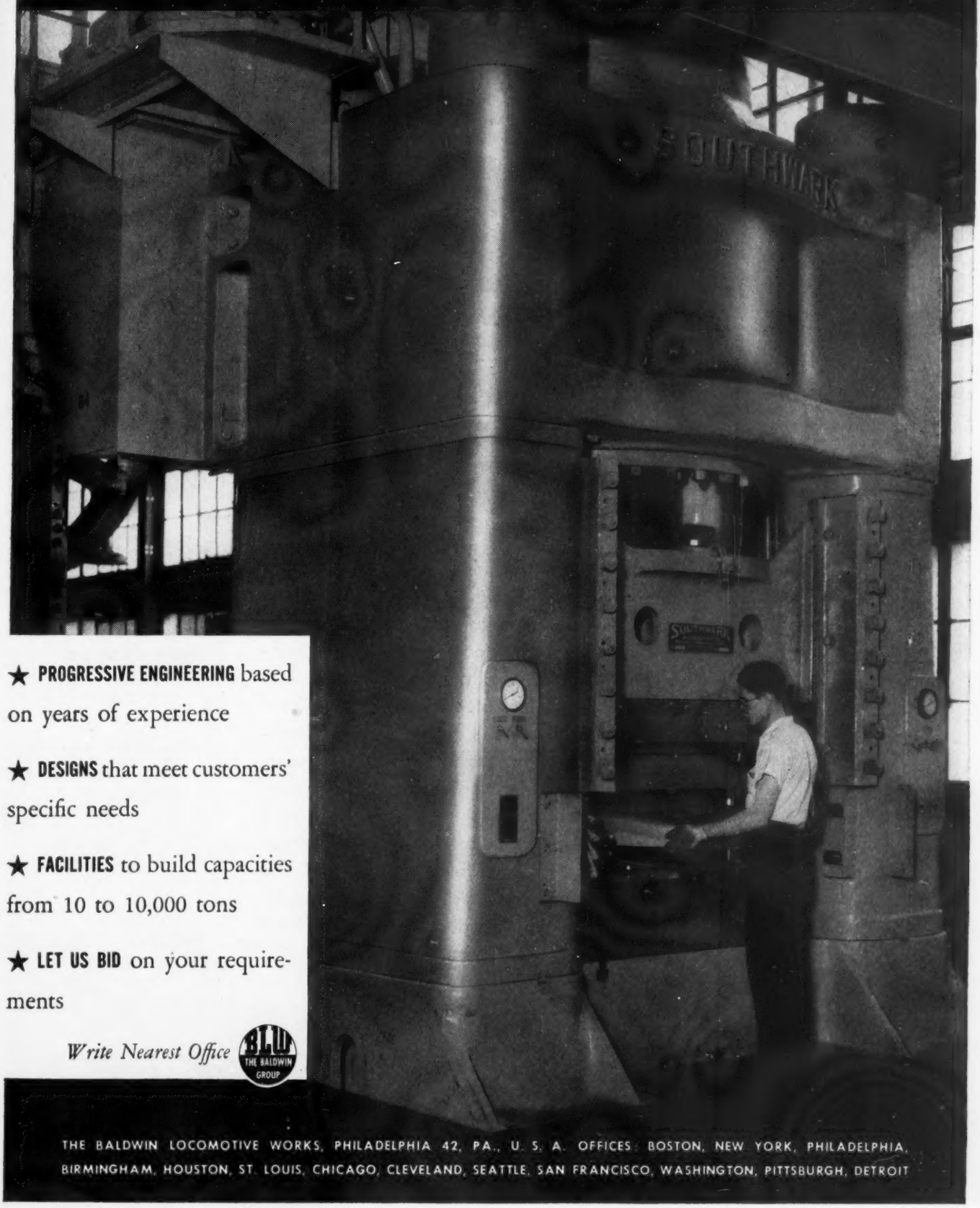


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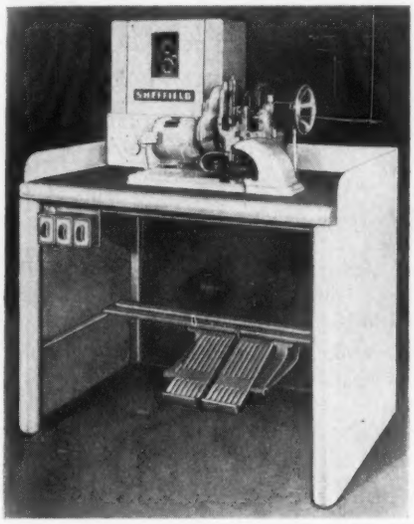
# New Products and Equipment

*Additional information on the new products and equipment described on this and succeeding pages may be obtained, without obligation, by checking appropriate numbers on the cards following page 110*

## 1. Welding Machine

Automatic contact type, point or disk welding machines are offered by Sheffield Corp., Dayton 1, O.,, for accurate and secure placement of electrical contact material on contact springs. Spring is loaded in a holding fixture and moves through a series of stages. In the disk machine, it involves the punching of the



disk, placing it at the proper location on the spring, welding the two together and finally, shaping the contact to the required flatness or contour.

Machine has a capacity of 83 cpm and production is limited by operator's ability to load machine. Control of welding current is made possible by an electronically operated panel. Machine was originally developed by Western Electric Co. and is produced by Sheffield under license arrangement.

## 2. Boring, Facing Machines

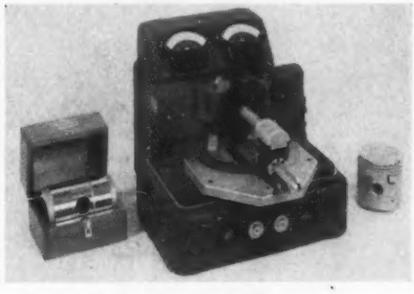
Developed to speed production of precision boring in large hard-to-handle castings, the Borface machines made by National Automatic Tool Co. Inc., Richmond, Ind., may be operated by semi-skilled personnel. They consist of either A-20A or A-20B units which may be mounted horizontally, vertically or at an angle.

Only difference between the two units is that the latter provides an automatic cross-facing drive and control which is inserted between the rear end of the spindle unit and the spindle drive motor. All units have heavy duty spindles mounted on preloaded bearings with worm and gear driven by V-belt drive to insure smooth flow of power to cutter bits.

The A-20B machine (illustrated) combines two units horizontally for facing both ends of valve bonnets simultaneously. Both machines may employ various work heads for specific work requirements.

## 3. Contour Gage

Fast, accurate means of checking the cam contour of automotive pistons is provided by an Electrolimit gage developed by Pratt & Whitney Division of Niles-Bement-Pond Co., West Hartford, Conn. This two-stage gaging fixture consists of a floating pressure shoe arbor mounted on a slide, so that the arbor may

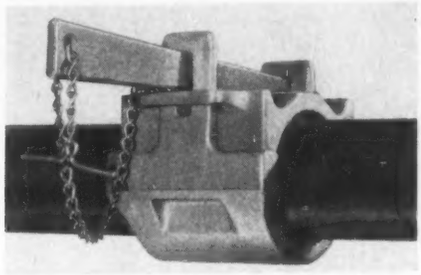


be pulled out to install the piston for gaging. Arbor assembly rotates through an arc of 180 degrees.

Two gaging heads are used to indicate the cam content, each having a floating gaging point and a fixed pickup point. When the piston is mounted on the floating pressure shoe arbor through the piston pin hole with the piston skirt up, the arbor is pushed into position and locked. The fixed pickup points contact the bottom piston ring and gaging points rest on the bottom of the cylinder skirt. As the piston is rotated, the meters indicate variation in cam contour between ring land and skirt.

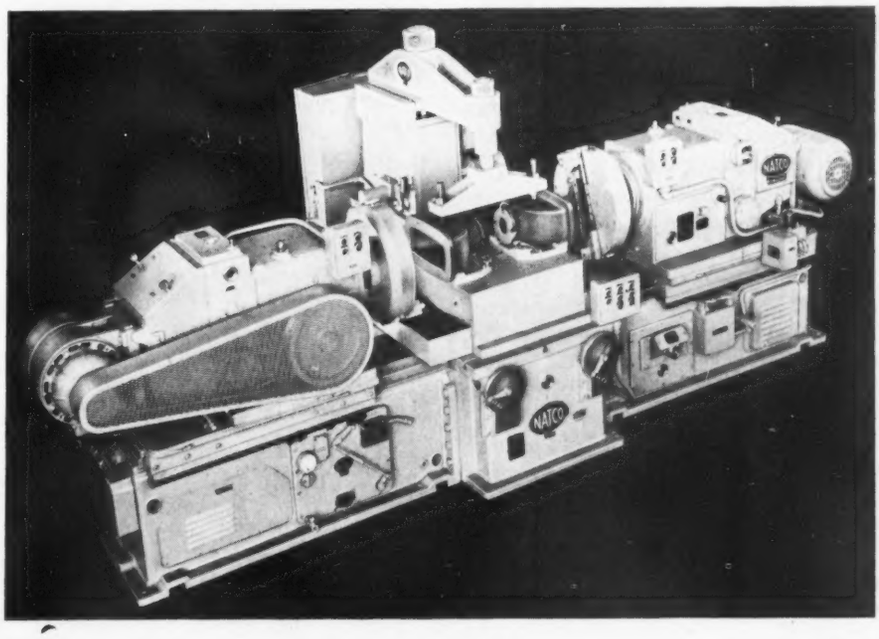
## 4. Pipe Coupling

Faster coupling of pipe at lower cost and with greater flexibility is possible with the Presto-Lock couplings manufactured by Drinkwater Inc., Spring and Madison streets, Waukegan, Ill. Made in seven sizes from 1¼ to 6 in., the couplings may be used with any plain end pipe, without threads, grooves or flanges. Only a hammer is needed to tighten wedge



keys after the two sections are fitted over pipe ends and keys are inserted in key channels.

Three parts consist of two corrosion-resistant castings and the wedge key. Malleable iron castings are used generally, other finishes being available. Five



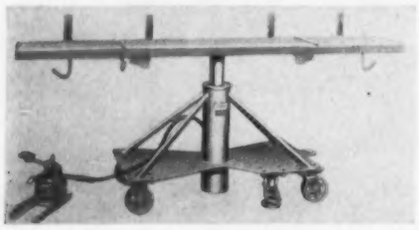
smallest sizes have one wedge key and chain to prevent loss of coupling parts. Two largest sizes have two wedge keys. Gaskets are replaceable and interchangeable butyl rubber or buna-N compound, depending upon solution handled in pipes. Flexibility of 40 degrees at each joint is possible.

## 5. Marking Machine

Marking on cylindrical or cone-shaped machine tool feed dials, optical devices, cylindrical sleeves, etc., is possible with the No. 203 marking machine announced by Jas. H. Matthews & Co., 3978 Forbes street, Pittsburgh 13. Two models are manufactured, a motor-driven and a bench model hand operated type. Former marks parts up to 6 in. diameter. Hand-operated machine handles parts up to 3 in. diameter.

## 6. Strip Feeding Table

For feeding strip or sheet metal to shears, rolling mills, punch presses and similar applications, Lyon-Raymond Corp., 3448 Madison street, Greene, N. Y., is offering a hydraulic elevating table, designed to accommodate bundles



of stock, loaded by overhead hoists or fork trucks. Its elevating feature enables the machine operator to keep stock at the desired height for feeding into dies or shears.

As table is portable, it may be readily moved with stock to another press. Hydraulic pump is joined to central cylinder by flexible hose which permits placing for convenience in operation. Table top consists of one rigid section and two removable extensions designed to support longer loads.

## 7. Liquid Level Gage

Measuring tank contents at any remote point, regardless of whether open, vented, under pressure or vacuum, is possible with the type S Tank-O-Meter manufactured by Uehling Instrument Co., 473 Getty Avenue, Paterson 3, N. J. It may be furnished with high or low alarm switches for closing or opening any circuit at any predetermined high or low level.

Fifty-two standard models for measuring liquid depths ranging from 1 ft to 75 ft are produced. They may be furnished for hand pump or compressed air operation as well.

## 8. Hardness Tester

Applying loads of 25 to 50,000 g, the new model LR Tukon hardness testing machine, announced by Wilson Mechanical Instrument Co. Inc., 230 Park avenue, New York 17, uses either the Knoop or 136-degree diamond pyramid indenter of the Vickers type. Features include fast speed elevating screw for adjustment to specimen thickness, meter

giving operator assurance load is being applied to the indentor, and indicating when the electronic tube is in operating condition and test cycle completed.

Knoop indenter is used for tests of 25 to 3600 or 5000 g. The diamond pyramid indenter is used for tests of 25 to 50,000 g. Loads from 10 to 50 kg are accessories.

## 9. Cellophane Tape

Sticky cellophane tape printed-to-order is offered by Mark Andrews Co., St. Louis 22, as Mark 'Andy Ready-To-Stick tape. Sticking without moistening, it is available with dispenser for a variety of industrial uses.

## 10. Cleaning Powder

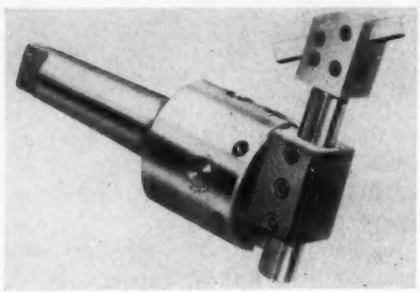
Completely soluble in hot or cold water, No. 100 cleaner, made by Optimus Detergents Co., 152 Water street, Matawan, N. J., is a blend of mild alkaline materials, including water softening ingredients. Free rinsing and at low concentrations soft on the skin, the cleaner is effective in removing light oils, grease and dirt from ferrous or nonferrous metals.

## 11. Insulation Tester

Herman H. Sticht Co. Inc., 27 Park place, New York 7, announces a combination model B-7 insulation tester and precision ohmmeter. It contains two megohm ranges, two ohm ranges and two test potentials for insulation resistance measurements. Instrument employs a vibrator transformer circuit to step up two No. 6 dry cells connected in series to furnish the test potential of 500 v, respectively 250 v dc.

## 12. Boring Bar Accessories

A large hole adaptor with a split sleeve holding, a ⅜, ½ or ⅝-in. tool bit in any boring bar No. A1500 and which will work diameters from 3¼ to 7 in. is available from Behr Products Co.,



13732 Woodward avenue, Detroit 3. This is one of the heavy duty accessories used in Behr boring bars for facing, boring, fly-tooling, etc., up to a 23 in. diameter.

Extra large adaptor increases the range to 10½-in. when used in a model A1501 bar. Tool holder illustrated in model 1501 bar is made to hold ⅜ or ½-in. tool bits. The range is: Bar A1500, up to 9 in. diameter; bar 1501, up to 18 in. diameter and with extra large adaptor, up to 23 in. diameter.

## 13. Hand Truck

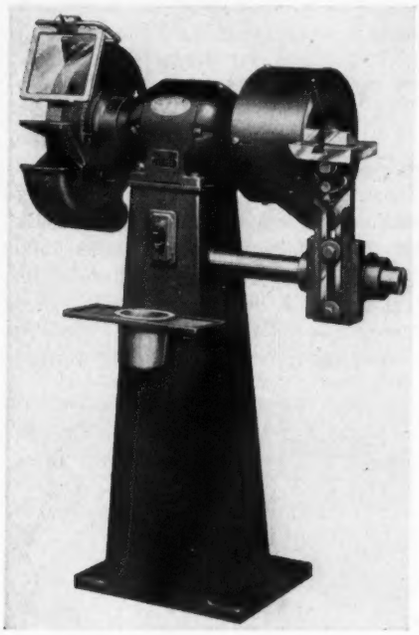
Featuring an aluminum alloy frame and incorporating I beam, interlocked construction with bolted assembly designed for miximum strength and minimum weight, the Freighter, a hand truck made by Thermoid Co., Trenton, N. J., has a bright, corrosive and spark-resistant finish. Balanced truck has a formed, heavy gage steel nose and easy rolling cast aluminum wheels riding on oversize ball bearings.

Trucks are 52 in. long, 18 in. wide and have a nose 7 in. long. Weighing

only 48 lb, they have a wheel diameter of 9 in. and a rated capacity of 1000 lb.

## 14. Tool Grinder

Model 260 carbide tool grinder announced by Bradford Machine Tool Co., Cincinnati 4, has a regular grinder for rough work mounted on its left and a cut wheel for accurate finish grinding mounted on the right. The work table is adjustable



to desired angles. It also compensates for height and wheel wear.

Grinder is equipped with eye shield, tool tray, water pot and guards with exhaust connections. Slope front is designed for maximum foot clearance. Motor, for 220-440 or 550 v, 2 or 3 phase, 50 or 60 cycles, is totally enclosed.

## 15. Hose Nozzle

Lever-type hose nozzle which controls spray or stream from light mist to heavy stream with only slight lever pressure, is produced by Kay Products Industry, Cleveland. Leakproof nozzle fits palm of hand. It is made of a Zamac casting, copper, nickel and chromium plated. Internal parts are of solid brass and phosphor bronze.

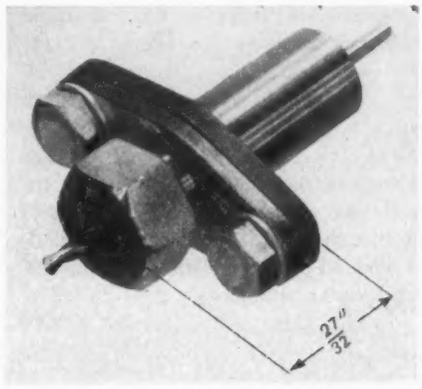
## 16. Engraving Tool

Designed for heavy duty industrial marking, the engraving tool offered by Falls Products Inc., Genoa, Ill., has a carboloy tip that marks surfaces up to rockwell C50 in hardness. Shaped to fit the hand, the tool has accessory bits for other operations, such as a diamond tip for marking extra hard surfaces. It can be used by toolmakers for filing, chiseling and shaping odd contours.

Weighing less than a pound, it delivers an impact of 5½-lb. Length of stroke is adjustable from a few thousandths to ⅛-in. with a delivery of 7200 power strokes per minute.

## 17. Floating Holder

Erickson Tools Division, 2309 Hamilton avenue, Cleveland 14, announces a redesigned Brown & Sharpe type ad-




justable floating holder for B & S 00 automatics. Designed for heavy duty use, it has heavier flanges and adjusting screws for greater wear. Overhand is reduced to 27/32-in. for increased rigidity, accuracy and maximum clearance.

Unit uses the same collet, each size with an over all collapsibility of 1/32-in. Holder grips along the entire length, allowing stubbing and prolonging tool life. Range is from ¼-in. down to a No. 80 drill.

## 18. Vibration Eliminator

The No. 140 series vibration eliminator, designed for installations where the comparative slow speed of a machine

requires an isolator of relatively great static deflection, is announced by Vibration Eliminator Co., 10-28 47th avenue, Long Island City 1, N. Y. By varying the durometer or hardness of the rubber this unit is available for loads between 100 and 400 lb each.

At these loads a static deflection as great as ½-in. may be secured, assuring high isolation efficiency for operating frequencies as low as 600 cpm. The design is an adaptation of the same isolator used for the floating power of a truck.

## 19. Barrel Lift

Raising loaded drums off the floor with ease, transporting them and arranging for tilting to dispense contents

is the function of the model No. 2 Barrel-Lift, produced by Falstrom Co., Box No. 118, Passaic, N. J.

Pickup consists of a safety locked chain arrangement encircling the drum. Mechanical linkage of the lifter is adjustable to give several degrees of leverage, permitting handling of drums up to 750 lb gross. Saddle head locks drums in a vertical position, or they may be locked in a tilted position.

## 20. Work Supporting Roller

Speed in polishing long, heavy pieces is provided by the Presto work supporting roller developed by Manderscheid Co., 810 Fulton street, Chicago 7. Unit consists of a rubber roller, 8½-in. long and 3 in. diameter, mounted on a large portable base. Height adjustment from 32 to 40 in. is possible.

## 21. Pocket Size Ohmeter

Compact, pocket-size ohmmeter for spot checking electronic circuit components, relays, generators, starters, clocks and other electrical equipment is announced by Radio Tube Division, Sylvania Electric Products Inc., 500 Fifth avenue, New York 18. It is enclosed in a tubular plastic case ⅞-in. in diameter and 5¾-in. long. Direct readings between 0 and

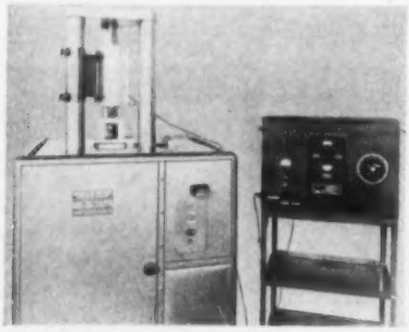
**FOR MORE INFORMATION**

on products and equipment described in this section, fill in a card following page 110.

10,000 ohms are given on a 1.5 ma full scale Weston meter in series with a 1000 ohm molder carbon resistor and a standard penlight dry cell.

## 22. Fatigue Machine

Equipped for tension-compression testing both at ambient and at high temperatures, the model SF-4 Sonntag fatigue machine, announced by the testing equipment division of Baldwin Locomotive Works, Philadelphia 42, includes many



principles of the Sonntag universal fatigue machine, particularly the automatic maintenance of a constant load throughout the whole period of the test.

Maximum capacity in either direction is 10,000 lb. Static preload capacity is 0 to 5000 lb; alternating load capacity is plus or minus 5000 lb; speed of testing is 3600 cycles per minute; and maximum movement of reciprocating platen is plus or minus 1/16-in. Dynamic load is applied by means of a revolving eccentrically disposed mass. Eccentric is of the micrometer screw type. Entire working mechanism is suspended on soft tension springs.

## 23. Torque Screw Driver

A new screw driver which operates on the friction disk principle with accuracy within a fraction of an inch-pound after as many as 300,000 operations is the Trutorq, announced by Airdraulics Engineering Inc., New Canaan, Conn. Called the model CSD-15, it has a calibrated head which allows setting to any desired torque from 1 to 15 in.-lb.

Tool has a handle of fluted plastic, a steel calibrated head and a cast aluminum body. Length complete with blade is 6¼-in. and weight is 3½-oz. Its lightness and small size make it suitable for work in hard-to-get-at places. Blades for various types of screws are available.

## 24. Replaceable Hammer Tips

Replaceable hammer tips of three grades of hardness are offered for the new series of Nupla hammers introduced by New Plastic Corp., 1017 North Sycamore avenue, Los Angeles 38. Two tips of different grades may be kept on a hammer at the same time, while the third may be substituted by spinning the tips on or off. Hammer has virtually no rebound or sting. Tips are chip proof, nonexplosive and won't flash burn.

## 25. Cutting Torch

Designed with a free-flow mixing chamber, the HC-39 Pacemaker torch manufactured by Wall Chemicals Division, Liquid Carbonic Corp., 3100 South Kedzie avenue, Chicago 23, is intended particularly for tough jobs. Recessed tip seat prevents damage if torch is dropped on its head. It measures 20 in. overall and weighs 3½-lb. Torch uses tellurium copper cutting tips for acetylene-oxygen cutting.

## 26. Die Casting Machine

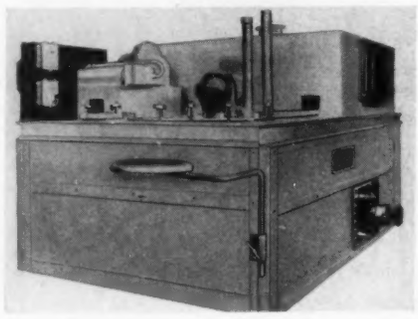
Provision has been made for automatic as well as manual operation of any single function of the No. 4 die casting machine announced by Wickes Brothers, Saginaw, Mich. High production of zinc, tin and lead castings is made possible by rapid closing and opening of the dies at 750 ipm with a momentary slow-down just before the dies close.

Distance between platen and bolster plates is adjustable from 9 to 23 in. by a single lever die adjustment mechanism, either hand or power-operated. Platen is positioned by turning the die opening adjustment lever. Casting knockout is automatic and hydraulically operated. Injection pressure is supplied by an accumulator which supplies the quick hammer blow pressure to twin injection cylinders.

Die opening may be adjusted from 6 to 16 in. by positioning a cam in the trip mechanism. Injection pressures from 1500 to 6000 psi are possible. Dual melting pots, one a preheat pot, the other an injection pot, are supplied. Heat is furnished by six infrared burners. Maximum injection capacity is 100 cu in.

## 27. Washing Machine

Laying particular emphasis on the problem of cleaning the hidden areas of ball bearing races, the new washing machine developed by Mabor Co., Clark Township, Rahway, N. J., handles 1500 to 3000 bearings, in sizes up to 6 in. diameter in 1 hour. Its variable speed conveyor is a link chain, wound around a series of sprockets supporting vertical

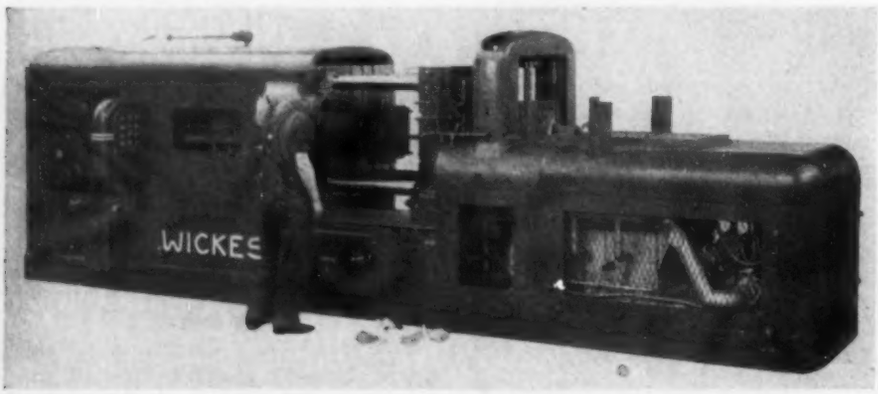


pyramidal holders which accommodate the bearings.

Races are rotated continuously by a friction strap and the eccentric sprays which are directed between the two races. Sprays are actuated by two 2-hp pumps. Equipment may be used with any spray treatment using one, two or three different sprays. A blow-off and dryer attachment may be attached.

## 28. All Steel Conveyor

Steel-Parts Mfg. Co., 222 South Morgan street, Chicago, is applying stainless steel belt links to any of its standard model all steel belt conveyors. Since links are nonrusting, they may be moved through damp areas without being affected. The surface resists staining or disintegration from acids.

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on the new products and equipment in this section, fill in this card. It will receive prompt attention.

# Helpful Literature

### 43. Cutting Tools

Weddell Tools, Inc.—28-page illustrated catalog No. 46 describes various types of face and side mills with carbide tipped, cast alloy or high speed steel Tri-Bits. Data covering mounting, speeds and feeds, cutter angles and grinds and tool maintenance are included.

### 44. Tractors

Caterpillar Tractor Co.—12-page illustrated catalog Form No. 10,000 presents evolution of tractors, progress achieved to date and plans for future progress. Development of heavy machinery is covered also.

### 45. Protective Coatings

American Chemical Paint Co.—8-page illustrated technical service data sheet No. P-100-21 presents information on line of rust proofing chemicals, protective coatings, metal cleaning chemicals and inhibitors.

### 46. Boring Bars & Tools

Carboloy Co.—16-page supplement No. GT-199 contains specifications and prices of such products as standard solid Carboloy boring tools, boring bars, solid unground rod, solid carbide face mill blades and solid ground balls.

### 47. Welding Accessories

Tweco Products Co.—12-page illustrated booklet entitled "Twecolog" gives data on Twecotong electrode holders, ground clamps, cable connectors, machine terminals, splicers, Twecolugs and electrode holder parts. Quantity price and parts list is included.

### 48. Roll Handling Attachment

Towmotor Corp.—2-page illustrated data sheet describes standard Upenders for picking up big, heavy or small rolls of paper in horizontal or vertical position. Unit turns, up ends, carries and stacks rolls of paper having diameters of from 36 to 60 inches and weighing from 2000 to 6500 pounds.

### 49. Flexible Couplings

Lord Mfg. Co.—4-page illustrated bulletin No. 200-C describes complete line of one-piece flexible couplings ranging in capacity from 1/8 to 1 horsepower and in 1/50-horsepower rating for special small load applications.

### 50. Plug Valves

Duriron Co.—2-page illustrated bulletin No. 617 gives complete details of Durco corrosion-resistant top lubricated plug valves made of Duriron or Durichlor. Operating features, illustrated parts list and dimensions of valve, available in seven sizes, are given.

### 51. Electronic Tubes

Westinghouse Electric Corp.—Booklet No. 86-020 entitled "Easy Guide to Electronic Tube Data" lists phototubes, pliotrons, thyratrons, ignitrons, kenatrons and planotrons, according to class, gives essential technical data on each tube and explains five functions of electronic tubes.

### 52. Steel Strapping

A. J. Gerrard & Co.—4-page illustrated folder describes Steelbinder tool which binds any size or shape object, large, small, round, square or irregular, for shipment and for indoor or outdoor storage. Tool uses 3/8, 1/2, 5/8 or 3/4-inch strap of any thickness up to .028-inch without mechanical adjustment.

### 53. Floor Maintenance

Safety & Maintenance Co.—6-page illustrated folder No. FB-19 is descriptive of Sol-Speedi-Dri all-purpose granular mineral absorbent for cleansing wood, cement or composition floors of liquids such as oil, water, grease, resins, acids and syrups.

### 54. Resistance Welders

Sciaky Bros. Inc.—4-page illustrated bulletin No. 1, Vol. 2, entitled "Resistance Welding at Work" describes three-phase resistance welders for welding mild steel, stainless steel, aluminum, light alloys and brass.

### 55. Foot-Operated Press

Rodgers Hydraulic Inc.—4-page illustrated booklet No. 223 is descriptive of Whitley Model No. 12 foot-operated press for production jobs requiring from 1 to 4 tons pressure. Specifications, dimensions and various applications are covered.

### 56. Magnetic Tools

Robbins Engineering Co.—8-page illustrated catalog entitled "Precision Equipment for Angular Set-Ups" is descriptive of Magna-Sine, Univ-Angle, sine plate and sine bar tools for holding precision work pieces at any desired single or compound angle.

### 57. Speed Reducers

Ottumwa Iron Works—4-page illustrated Form No. 102 presents information on series DR double reduction speed reducers which are fully enclosed, automatically lubricated, dustproof and oil tight. Complete dimensions, specifications, capacities and ratios are shown.

### 58. Press Rolls

B. F. Goodrich Co.—4-page illustrated folder provides information on steel-jacketed Vulcalock press rolls. Rolls are vulcanized hydraulically under 225 pounds pressure per square inch and rubber is bonded to steel with adhesion exceeding 500 pounds per square inch.

### 59. Floor Repair Material

Stonhard Co.—Illustrated folder entitled "Faster Floor Repairs" contains data on Stonfast floor repairing material, its use and installation. Information on repairing rough floors in traffic lanes and important working areas to permit immediate heavy duty service is presented.

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### 60. Code Supervisory Units

General Electric Co.—8-page illustrated bulletin No. GEA-1448B gives data on automatic supervisory equipment for remote control power apparatus. Information on application, operation and use of accessory equipment is included.

### 61. Stainless Steel Cutting

Air Reduction Sales Co.—12-page illustrated booklet "Flux Injection Cutting of Stainless Steels" reprinted from STEEL describes fundamentals, capacities and advantages of method in which flux is injected directly into cutting-oxygen stream to remove chemically obstructing oxides and expose base metal to cutting jet.

### 62. Oil Coolers

Bell & Gossett Co.—24-page illustrated bulletin No. OC-743 contains data on B & G Rapid oil coolers and heat transfer equipment. Features of construction, applications, dimensions and ordering instructions for heat exchangers, pumps, oil strainers, quench and wash tanks, water heaters and controls are given.

### 63. Carbide Tipped Tools

Schmarje Tool & Engineering Co.—12-page illustrated catalog No. 146 provides specifications. dimensions, prices and ordering instructions covering reamers, counterbores, spot facers, centers and form tools of standard and special types.

### 64. Foundry Dust Control

Claude B. Schneible Co.—32-page illustrated bulletin No. 47 shows how effective dust control and ventilation are applied to various foundry departments. It discusses system and equipment which require minimum of exhaust air from operation being ventilated, occupy minimum of space and cope with every dust and fume encountered in any mechanized foundry.

### 65. Silicone Insulation

Dow Corning Corp.—2-page data sheet No. B-30-1 deals with specifications for rewinding alternating current induction motors with Silicone insulation and gives information on inorganic insulation bonded and impregnated with semi-inorganic Silicone resins and varnishes.

### 66. Cutter Sharpening Unit

Cincinnati Milling Machine Co.—16-page illustrated bulletin No. M-1552 describes contour cutter sharpening machine for contour ground form cutters. Details of capacity, range, speeds and dimensions are given.

### 67. Magnetic Clutches

Stearns Magnetic Mfg. Co.—20-page illustrated catalog No. 226 is descriptive of magnetic clutches and clutch-brake units. Applications, specifications, torque formulas and other information on this magnetic friction device are presented.

### 68. Salt Bath Heat Treating

American Cyanamid Co.—28-page illustrated booklet entitled "Salt Bath Heat Treatment" discusses development of modern salt baths, salt bath furnaces, treating, carburizing and maintenance.

### 69. Wear-Testing Accessories

Taber Instrument Corp.—12-page illustrated bulletin No. 4702-3500 presents information on line of accessories for use with Taber Abraser in wear-testing electrodeposited metals, organic coatings and other surface finishes. Vacuum pick-up attachment, interval timer, duplex refacing stone and Abraser Dry-Mount are among accessories covered.

### 70. Brass Rods

American Brass Co.—24-page illustrated bulletin entitled "Anaconda Free Cutting Brass Rods" deals with brass rods for screw machine products. Rods composed of copper, zinc and lead are available in round, hexagon, octagon, square, rectangular, oval, half round and other standard shapes.

### 71. Sketch & Specification Pad

Adamas Carbide Corp.—Bound sketch and specification pad of cross-section paper aids in ordering of preformed blanks. Standard tolerances indicating oversize manufacturing allowances and specification box with space for all required information are found on each page.

### 72. Magnetic Materials

Allegheny Ludlum Steel Corp.—32-page illustrated brochure entitled "Magnetic Materials," prepared to aid electrical engineers and fabricators, explains in simple manner basic functions of core materials. Diagrams and text show comparative properties of wide range of magnetic steels and alloys.

### 73. Gas Carburizing

Surface Combustion Corp.—16-page illustrated bulletin No. SC-134 discusses modern gas carburizing processes and equipment. Applicable prepared atmospheres, their composition, use and method of preparation are described. Various charts, graphs and tables as well as photomicrographs of steel processed by different heat treatments are shown.

### 74. Castings

Utica Radiator Corp.—4-page illustrated booklet explains various facilities for producing castings of magnesium, aluminum and gray iron. Seven-page supplementary bulletin discusses availability, machinability, corrosion resistance, and mechanical and physical properties of magnesium alloy castings.

### 75. Silent Chain Drive

Link-Belt Co. — 16-page illustrated booklet No. 2010 contains information on 3/16-inch pitch silent chain drives for fractional horsepower. Also discussed are typical applications, dimensions of sprocket wheels, horsepower ratings, selection of chain drive, calculation of chain drive centers and length of chain required.

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# Steel Industry Faces New Coal Mine Crisis

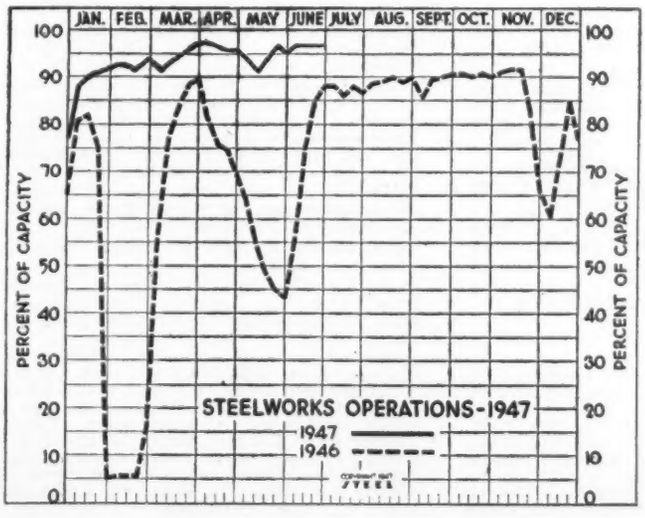
*Mills have accumulated fair stocks in anticipation of coal miners' scheduled vacation but would be adversely affected by a subsequent strike . . . Mine shutdowns coincide with start of mass vacations in metalworking industries*

WHILE the walkout by soft coal miners in protest to passage of the Taft-Hartley labor act has had little effect on national steelmaking operations to date, mill operators are watching developments in the coal crisis closely. Fuel stocks had been accumulated in anticipation of the scheduled 10-day mine vacation period starting last Friday and the walkouts by miners earlier in the week were considered as just "jumping the gun" in starting the vacation.

If a new contract between the mine operators and the union is not reached this week, fairly sharp curtailments in steel mill operations may be expected next week, with production continuing downward until the coal dispute is settled.

At the beginning of April, steel and rolling mills held 1,141,000 tons of coal, equivalent to 37 days' requirements, according to the latest coal report issued by the Bureau of Mines. It is believed stocks have been increased during the past several months. However, fuel inventories vary widely among the various mills and some will feel the effect of the mines stoppage quickly.

Shutdown of coal mines this week coincides with the beginning of mass vacation shutdowns. More iron and steel consuming plants will close down during July and August than at any time in the history of the metalworking industry. Many of these suspensions have long been contemplated, but the ominous outlook in soft coal undoubtedly has added substantially to the movement. Not only are many metalworking plants closing down for one to two weeks for vacations, but also a greater number of steel plants, principally finishing units, than heretofore are closing for this purpose.




**DISTRICT STEEL RATES**

Percentage of Ingot Capacity Engaged in Leading Districts

| | Week Ended June 28 | Change | Same Week 1946 | Same Week 1945 |
|---|---|---|---|---|
| Pittsburgh | 100.5 | — 1 | 93.5 | 88 |
| Chicago | 95.5 | None | 88 | 95.5 |
| Eastern Pa. | 93 | None | 85 | 90 |
| Youngstown | 93 | None | 86 | 90 |
| Wheeling | 93.5 | + 4.5 | 85.5 | 90.5 |
| Cleveland | 91 | — 1.5 | 90.5 | 93 |
| Buffalo | 88.5 | None | 88.5 | 93 |
| Birmingham | 99 | None | 99 | 95 |
| New England | 90 | — 2 | 85 | 84 |
| Cincinnati | 87 | + 2 | 86 | 89 |
| St. Louis | 84.5 | None | 54.5 | 75 |
| Detroit | 88 | None | 89 | 83 |
| Estimated national rate | 96.5 | None | 88 | 92 |

Based on weekly steelmaking capacity of 1,749,928 net tons for 1947; 1,762,381 net tons for 1946; 1,831,636 tons for 1945.

Most consuming plants in closing down have requested suspension of steel mill shipments and most of them will not sacrifice any tonnage by having done so. However, this is not so true of foundries, many of which first requested suspension of shipments of pig iron only to reverse their position when warned by producers that they might not get their full quotas.

Meanwhile, the price situation has become mixed. After manifesting considerable strength recently, melting steel scrap developed an easier undertone in eastern Pennsylvania and New England while continuing the uptrend in Pittsburgh, Chicago and a few other consuming districts. In pig iron, extension of the bonus incentive plan and allocations program on foundry iron production for another six months appears to have precluded any general advance on that grade of iron for the present.

However, an early advance in basic iron, possibly as much as $2 a ton, may be posted due in part to the upward trend in coke prices. Beehive foundry coke has been advanced $2 a ton recently in some quarters, and it appears likely that by-product foundry grades will be increased soon. Demand for coke continues particularly strong and by-product producers are disposed to equalize with beehive producers.

In the finished steel markets, the only major price change last week was an advance of $2 a ton in the price of plates that was announced by the Claymont, Del., producer. This advance, attributed chiefly to higher raw material costs, was not followed by any other producer.

STEEL's composite price average for steelmaking scrap advanced for the fifth consecutive week to $35.08 which compares with the mid-May average of $29.42. Other composites held steady at $69.82 for finished steel, $52.10 for semifinished steel and $32.49 for steelmaking pig iron.

Estimated national steel ingot production rate held last week at 96.5 per cent of capacity. While operations eased 1 point to 100½ per cent in Pittsburgh, 2 points to 90 per cent in New England, and 1½ points to 91 per cent in Cleveland, they rose 4½ points to 93.5 per cent in Wheeling and 2 points to 87 per cent in St. Louis.

# COMPOSITE MARKET AVERAGES

| | June 28 | June 21 | June 14 | One Month Ago May, 1947 | Three Months Ago Mar., 1947 | One Year Ago June, 1946 | Five Years Ago June, 1942 |
|---|---|---|---|---|---|---|---|
| Finished Steel | $69.82 | $69.82 | $69.82 | $69.82 | $69.82 | $64.09 | $56.73 |
| Semifinished Steel | 52.10 | 52.10 | 52.10 | 52.10 | 52.10 | 40.60 | 36.00 |
| Steelmaking Pig Iron | 32.49 | 32.49 | 32.49 | 32.49 | 32.40 | 27.50 | 23.00 |
| Steelmaking Scrap | 35.08 | 33.50 | 31.25 | 29.75 | 37.25 | 19.17 | 19.17 |

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

# COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others, dollars per gross ton.

## Finished Material

| | June 28, 1947 | May, 1947 | Mar., 1947 | June, 1946 |
|---|---|---|---|---|
| Steel bars, Pittsburgh | 2.60c | 2.60c | 2.60c | 2.50c |
| Steel bars, Philadelphia | 2.98 | 2.98 | 2.98 | 2.82 |
| Steel bars, Chicago | 2.60 | 2.60 | 2.60 | 2.50 |
| Shapes, Pittsburgh | 2.50 | 2.50 | 2.50 | 2.35 |
| Shapes, Philadelphia | 2.64 | 2.64 | 2.64 | 2.465 |
| Shapes, Chicago | 2.50 | 2.50 | 2.50 | 2.35 |
| Plates, Pittsburgh | 2.65 | 2.65 | 2.65 | 2.50 |
| Plates, Philadelphia | 2.85 | 2.85 | 2.85 | 2.55 |
| Plates, Chicago | 2.65 | 2.65 | 2.65 | 2.50 |
| Sheets, hot-rolled, Pittsburgh | 2.50 | 2.50 | 2.50 | 2.425 |
| Sheets, cold-rolled, Pittsburgh | 3.20 | 3.20 | 3.20 | 3.275 |
| Sheets, No. 10 galv., Pittsburgh | 3.55 | 3.55 | 3.55 | †4.05 |
| Sheets, hot-rolled, Gary | 2.50 | 2.50 | 2.50 | 2.425 |
| Sheets, cold-rolled, Gary | 3.20 | 3.20 | 3.20 | 3.275 |
| Sheets, No. 10 galv., Gary | 3.55 | 3.55 | 3.55 | †4.05 |
| Hot-rolled strip, Pittsburgh | 2.50 | 2.50 | 2.50 | 2.35 |
| Cold-rolled strip, Pittsburgh | 3.20 | 3.20 | 3.20 | 3.05 |
| Bright basic, bess. wire, Pittsburgh | 3.425 | 3.425 | 3.425 | 3.05 |
| Wire nails, Pittsburgh | 4.125 | 4.125 | 4.125 | 3.50 |
| Tin plate, per base box, Pittsburgh | $5.75 | $5.75 | $5.75 | *$5.25 |

* Nominal. † Base, No. 24 gage.

## Semifinished Material

| | | | | |
|---|---|---|---|---|
| Sheet bars, Pittsburgh, Chicago | $50.00 | $50.00 | $50.00 | $38.00 |
| Slabs, Pittsburgh, Chicago | 42.00 | 42.00 | 42.00 | 39.00 |
| Rerolling billets, Pittsburgh | 42.00 | 42.00 | 42.00 | 39.00 |
| Wire rods $\frac{7}{32}$ to $\frac{1}{4}$-inch, Pitts. | 2.55c | 2.55c | 2.55c | ‡2.30c |

‡ Base, No. 5 to $\frac{7}{32}$-in.

## Pig Iron

| | June 28, 1947 | May, 1947 | Mar., 1947 | June, 1946 |
|---|---|---|---|---|
| Bessemer, de., Pittsburgh | $34.83 | $34.83 | $34.83 | $29.69 |
| Basic, Valley | 33.00 | 33.00 | 33.00 | 28.00 |
| Basic, eastern del. Philadelphia | 35.52 | 35.52 | 34.26 | 27.84 |
| No. 2 fdry., del. Pgh. N. & S. sides | 34.33 | 34.33 | 34.33 | 29.19 |
| No. 2 fdry., del. Philadelphia | 36.02 | 36.02 | 34.76 | 28.34 |
| No. 2 foundry, Chicago | 33.00 | 33.00 | 33.00 | 28.50 |
| Southern No. 2 Birmingham | 29.88 | 29.88 | 29.28 | 22.88 |
| Southern No. 2, del. Cincinnati | 34.75 | 34.75 | 34.15 | 26.94 |
| Malleable, Valley | 33.50 | 33.50 | 33.50 | 28.50 |
| Malleable, Chicago | 33.50 | 33.50 | 33.50 | 28.50 |
| Charcoal, low phos., fob Lyles, Tenn. | 40.50 | 40.50 | 40.50 | 33.00 |
| Gray forge, del. McKees Rocks, Pa. | 33.66 | 33.66 | 33.66 | 28.55 |
| Ferromanganese, fob cars, Pittsburgh | 140.25 | 140.25 | 140.25 | 140.00 |

## Scrap

| | | | | |
|---|---|---|---|---|
| Heavy melt steel, No. 1, Pittsburgh | $34.75 | $30.00 | $37.25 | $20.00 |
| Heavy melt. steel, No. 2, E. Pa. | 36.75 | 28.35 | 38 50 | 18.75 |
| Heavy melt. steel, Chicago | 33.75 | 29.25 | 35.125 | 18.75 |
| Rails for rerolling, Chicago | 40.50 | 34.50 | 40.75 | 22.25 |
| No. 1 cast, Chicago | 39.00 | 36.90 | 43.25 | 20.00 |

## Coke

| | | | | |
|---|---|---|---|---|
| Connellsville, furnace ovens | $10.00 | $9.125 | $8.875 | $8.75 |
| Connellsville, foundry ovens | 10.875 | 10.375 | 10.375 | 9.50 |
| Chicago, by-product fdry., del. | 16.10 | 16.10 | 16.10 | 13.75 |

# FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Delivered prices do not include the 3 per cent federal tax on freight.

## Semifinished Steel

**Carbon Steel Ingots:** Rerolling quality, standard analysis, price negotiated, fob mill. Forging quality, $40, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown. **Alloy Steel Ingots:** Pittsburgh, Canton, $52.

**Rerolling Billets, Blooms, Slabs:** Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, $42; Portsmouth Steel Corp., $55-$60, Portsmouth, O. Detroit, del., $45; eastern Mich., $46.

**Forging Quality Blooms, Slabs, Billets:** Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $50; Detroit, del., $53; eastern Mich., $54.

**Alloy Billets, Slabs, Blooms:** Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $61; del. Detroit $64; eastern Mich., $65.

**Sheet Bars:** Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $50; Portsmouth Steel Corp., $66, Portsmouth, O.

**Skelp:** Pittsburgh, Sparrows Point, Youngstown, Coatesville, 2.35c per lb.

**Wire Rods:** Pittsburgh, Chicago, Cleveland, Birmingham, $\frac{7}{32}$ to $\frac{1}{4}$-in., inclusive $2.55-$2.80 per 100 lb. Galveston base, $2.65. Worcester, add $0.10. San Francisco (base, del.), $3.27.

## Bars

**Hot-Rolled Carbon Bars and Bar-Size Shapes under 3-in.:** Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham, Duluth, base, 20 tons one size, 2.60c; Detroit, del., 2.75c; eastern Mich., 2.80c; New York, del., 3.01c; Phila., del., 2.98c; San Francisco (base, del.), 3.33-3.65c; Los Angeles (base, del.), 3.325-3.56c; Seattle, 3.285c, base.

**Rail Steel Bars:** Price, 2.60c-2.95c, same basing points as merchant carbon bars, except base is 10 tons.

**Hot-Rolled Alloy Bars:** Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 3.05c; Detroit, del., 3.20c; eastern Mich., 3.25c (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

**Cold-Finished Carbon Bars:** Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 20,000-39,999 lb, 3.20c; Detroit, 3.35c; Toledo, 3.40c.

**Cold-Finished Alloy Bars:** Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Canton, base, 3.80c; Detroit, del., 3.95c; eastern Mich., 4.00c.

**Reinforcing Bars (New Billet):** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.45c; San Francisco (base, del.), 3.03c; Los Angeles (base, del.), 3.025c; Seattle, 2.985c, base.

**Reinforcing Bars (Rail Steel):** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo, base, 2.60c-2.95c.

**Iron Bars:** Single refined, Pittsburgh, 6.15c-†6.70c; double refined, 7.00-†8.50c; Pittsburgh, staybolt, 7.85c-†10.00c.

† Hand puddled.

## Sheets

**Hot-Rolled Sheets:** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base, 2.50c; Detroit, del., 2.65c; eastern Mich., del., 2.70c; Philadelphia, del., 2.70c; New York, del., 2.79c; Los Angeles (base, del.), 3.24c; San Francisco, (base, del.), 3.245c. (Andrews Steel Co., quotes Middletown, O., base for shipment to Detroit; Alan Wood Steel Co., Conshohocken, Pa., quotes 3.10c, Sparrows Point, Md., base; Granite City Steel Co., 2.875c, fob Granite City, Ill., 2.775c, fob Gary or Birmingham.)

**Cold-Rolled Sheets:** Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.20c; Granite City, base, 3.30c; Detroit, del., 3.35c; eastern Mich., del., 3.40c; New York, del., 3.61c; Philadelphia, del., 3.58c.

**Galvanized Sheets, No. 10;** (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham, Youngstown, Sparrows Point, Canton, Middletown, base 3.55c; New York, del., 3.84c; Philadelphia, del., 3.75c; Los Angeles (base, del.), 4.32c; San Francisco (base, del.), 4.325c.

**Corrugated Galvanized Sheets, No. 10;** (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham, base, 3.65

**Culvert Sheets, No. 16 flat;** (Based on 5 cent zinc), corrugated 10 cents extra; Pittsburgh, Chicago, Gary, Birmingham: Copper alloy, 4.15c; copper-iron or pure iron, 4.50c. Granite City base prices 10 points higher. Los Angeles (base, del.), 4.94c; San Francisco (base, del.), 4.945c.

**Aluminized Sheets, No. 20:** Hot-dipped, coils or cut to lengths: Pittsburgh, 9.00c.

**Long Ternes, No. 10:** Pittsburgh, Chicago, Gary, base, 3.55c.

**Enameling Sheets, No. 12:** Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base, 3.55c; Granite City, base, 3.65c; Detroit, del., 3.70c; eastern Mich., 3.75c.

**Electrical Sheets, No. 24:** Field: Pittsburgh, Chicago, Gary, 4.20c; Kokomo, Ind., 4.30c. Armature: Pittsburgh, Chicago, Gary, 4.50c; Granite City, Ill., Kokomo, Ind., 4.60c. Electrical: Pittsburgh, Chicago, Gary, 5.00c; Granite City, Kokomo, 5.10c. Motor: Pittsburgh, Chicago, Gary, 5.75c; Granite City, 5.85c. Dynamo: Pittsburgh, 6.45c; Granite City, 6.55c. Transformer 72, 6.95c; 65, 7.65c; 58, 8.35c; 52, 9.15c, Pittsburgh.

## Strip

**Hot-Rolled Strip:** Pittsburgh, Chicago, Gary, Birmingham, Youngstown, base, 2.50c; Detroit, del., 2.65c; eastern Mich., del., 2.70c. (Superior Steel Corp., 3.30c, Pittsburgh.)
**Cold-Rolled Strip,** 0.25 carbon and less: Pittsburgh, Cleveland, Youngstown, 3.20c; Chicago, base, 3.30c; Detroit, del. 3.35c; eastern Mich., 3.40c; Worcester, base, 3.40c. (Superior Steel Corp., 4.70c, Pittsburgh.)
**Cold-Finished Spring Steel:** Pittsburgh, Cleveland base: 0.26-0.40 carbon, 3.20c; over 0.40 to 0.60 carbon, 4.70c; over 0.60 to 0.80, 5.30c; over 0.80 to 1.00, 6.80c; over 1.00, 9.10c; add 0.20c for Worcester.

## Tin, Terne, Plate

**Tin Plate:** Pittsburgh, Chicago, Gary, Warren, O., 100-lb base box, $5.75; Granite City, Birmingham, Sparrows Point, $5.85.
**Electrolytic Tin Plate:** Pittsburgh, Gary, Warren, O., 100-lb base box 0.25 lb tin, $4.85; 0.50 lb tin, $5.05; 0.75 lb tin, $5.25; Granite City, Birmingham, Sparrows Point, $4.95, $5.15, $5.35, respectively.
**Tin Mill Black Plate:** Pittsburgh, Chicago, Gary, Warren, O., base 29-gage and lighter, 3.60c; Granite City, Birmingham, Sparrows Point, 3.70c.
**Manufacturing Ternes (Special Coated):** Pittsburgh, Chicago, Gary, 100-lb base box $4.90; Granite City, Birmingham, Sparrows Point, $5.00.
**Roofing Ternes:** Pittsburgh base per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $13.50; 15-16 $15.50.

## Plates

**Carbon Steel Plates:** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, 2.65c; Coatesville, Claymont, Geneva, Utah, 2.80c; New York, del. 2.94c; Phila., del., 2.85c; St. Louis, del., 2.47c; Boston, del., 2.86c; San Francisco and Los Angeles, del., 3.29c-3.46c.
(Central Iron & Steel Co., Harrisburg, Pa., 3.85c, basing points; Alan Wood Steel Co., Conshohocken, Pa., 2.80c, Coatesville and Claymont equivalent; Worth Steel Co., Claymont, Del., 2.90c mills.)
**Floor Plates:** Pittsburgh, Chicago, 3.90c.
**Open-Hearth Alloy Plates:** Pittsburgh, Chicago, 3.787c; Coatesville, 4.15c.
**Clad Steel Plates:** Coatesville, 10% cladding: Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 29.00c.

## Shapes

**Structural Shapes:** Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.50c; New York, del., 2.70c; Phila., del., 2.64c; Geneva, Utah (base, del), 2.675c; Los Angeles (base, del.), 3.17c-3.41c; Los Angeles and San Francisco (sizes produced at Geneva only), del., 3.14c; Kaiser, del., San Francisco, 3.41c.
(Phoenix Iron Co., Phoenixville, Pa., nominally, 4.00c, fob Phoenixville.)
**Steel Piling:** Pittsburgh, Chicago, Buffalo, $3 per 100 lb.

## Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds).

| | |
|---|---|
| **Wire to Manufacturers in carloads** | |
| Bright, basic or bessemer | *$3.30–$3.55 |
| Spring (except Birmingham) | **$4.25 |
| **Wire Products to Trade** | |
| **Nails and Staples** | |
| Standard and cement-coated | †$3.75–$4.50 |
| Galvanized | ‡$3.75–$4.50 |
| **Wire,** Merchant Quality | |
| Annealed (6 to 8 base) | §$3.95 |
| Galvanized (6 to 8 base) | §$4.40 |
| (Fob Pittsburgh, Chicago, Birmingham, per base column) | |
| **Woven fence,** 15 gage and heavier | ††84 |
| **Barbed wire,** 80-rod spool | ††94 |
| **Barbless wire,** twisted | 94 |
| **Fence posts** (no clamps) | ††90 |
| **Bale ties, single loop** | ††86 |

* Worcester, $3.40, Duluth, $3.35, base. San Francisco (base, del.) $4.31 for bright basic only.
** Worcester $4.35, Duluth and Trenton, N. J., $4.50, base. San Francisco (base, del.) $5.63 for MB spring wire; $5.28 black premier.
† Worcester $4.05, Cleveland $3.85, base. San Francisco (base, del.) $4.83.
‡ Duluth $3.75, Cleveland $3.85, base. San Francisco (base, del.) $4.83.
§ Worcester $4.05, annealed; $4.50, galvanized. Duluth $3.95, annealed; $4.40, galvanized base. San Francisco (base, del.) $4.96, annealed; $5.41, galvanized.
†† San Francisco (base, del.): Woven fence, 107; barbed wire, 114; bale ties, 110. Duluth (base): Woven fence, 84; barbed wire, 94; fence posts, 90.

## Rails, Supplies

**Rails:** Standard, over 60-lb fob mill, $2.50 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, $2.85 per 100 lb; light rails (rail steel), Williamsport, Pa., $3.20, Pittsburgh, $2.85. Relaying, 60 lb and over fob warehouse $45-$47 per net ton.
**Supplies:** Track bolts, 6.50c; heat treated, 6.75c. Tie plates, $2.80 per 100 lb, fob mill; $3.15 base, Seattle. Splice bars, $3 per 100 lb. Standard spikes, 3.65c-4.50c; screw spikes, 5.30-6.40c.

## Tubular Goods

**Standard Pipe:** Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 point less on steel butt weld on sizes produced in that district.

**Butt Weld**

| In. | Steel Blk. | Steel Gal. | In. | Iron Blk. | Iron Gal. |
|---|---|---|---|---|---|
| ⅛ | 48 | 23 | ½ | — 2 | +20 |
| ¼ & ⅜ | 51 | 30½ | ¾ | —11½ | +10 |
| ½ | 55½ | 41 | 1-1¼ | —17 | + 2 |
| ¾ | 58½ | 45 | 1½ | —22½ | — 1½ |
| 1-3 | 60½ | 47½ | 2 | —23 | — 2 |

**Lap Weld**

| In. | Steel Blk. | Steel Gal. | In. | Iron Blk. | Iron Gal. |
|---|---|---|---|---|---|
| 2 | 53 | 39½ | 1¼ | — 1 | +20 |
| 2½-3 | 56 | 42½ | 1½ | — 7 | +13 |
| 3½-6 | 58 | 44½ | 2 | —14½ | + 5½ |
| *8 | 58 | 42½ | 2½-3½ | —17 | + 1½ |
| *10 | 57½ | 42 | 4 | —21 | — 4 |
| *12 | 56½ | 41 | 4½-8 | —19 | — 2½ |
| | | | 9-12 | —10 | + 7 |

* Not T. & C.

**Seamless**
Steel

| In. | Blk. | Gal | In. | Blk. | Gal |
|---|---|---|---|---|---|
| 2 | 52 | 38½ | *8 | 57 | 42 |
| 2½-3 | 55 | 41½ | *10 | 56½ | 42 |
| 3½-6 | 57 | 43½ | *12 | 55½ | 41 |

* Not T. & C.

**Line Pipe:** Base price in carlots to consumers about $200 a net ton. Base discounts Pittsburgh and Lorain, O.

| In. | Seamless | In. | Butt Weld |
|---|---|---|---|
| 2 | 51 | ⅛ | 47 |
| 2½ & 3 | 54 | ¼ & ⅜ | 50 |
| 3½ to 8 | 56 | ½ | 54½ |
| 10 | 55½ | ¾ | 57½ |
| 12 | 54½ | 1 to 3 | 59½ |

**Boiler Tubes:** Net base prices per 100 feet, fob Pittsburgh, in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

| O.D. Sizes | B.W.G. | Seamless Hot Rolled | Seamless Cold Drawn | Elec. Weld Hot Rolled | Elec. Weld Cold Drawn |
|---|---|---|---|---|---|
| 1" | 13 | .... | $10.89 | $10.62 | $10.62 |
| 1¼" | 13 | .... | 12.90 | 10.59 | 12.58 |
| 1½" | 13 | $12.00 | 14.26 | 11.70 | 13.90 |
| 1¾" | 13 | 13.65 | 16.23 | 13.31 | 15.82 |
| 2" | 13 | 15.29 | 18.17 | 15.00 | 17.95 |
| 2¼" | 13 | 17.05 | 20.26 | 16.71 | 20.00 |
| 2¼" | 12 | 18.78 | 22.31 | 18.38 | 22.00 |
| 2½" | 12 | 20.57 | 24.43 | 20.11 | 24.07 |
| 2¾" | 12 | 21.80 | 25.89 | 21.27 | 25.46 |
| 3" | 12 | 22.87 | 27.18 | 22.26 | 26.68 |
| 3¼" | 11 | 26.88 | 31.94 | 26.15 | 31.33 |
| 3½" | 11 | 28.86 | 34.30 | 28.06 | 33.64 |
| 4" | 10 | 35.82 | 42.55 | 34.78 | 41.68 |
| 4½" | 9 | 47.48 | 56.42 | .... | .... |
| 5" | 9 | 54.96 | 65.30 | .... | .... |
| 6" | 7 | 84.38 | 100.25 | .... | .... |

**Pipe, Cast Iron:** Class B, 6-in. and over $65 per net ton, Birmingham; $70, Burlington, N. J.; $75.56, del., Chicago; 4-in. pipe, $5 higher, Class A pipe, $3 a ton over class B.

## Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 15c per cwt, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step and plow bolts.

**Carriage and Machine Bolts**

| | |
|---|---|
| ½-in. and smaller; up to 6 in. in length | 48 off |
| ⅝ and ¾ x 6-in. and shorter | 50 off |
| Larger diameter; longer than 6 in. | 47 off |
| Tire bolts | 38 off |
| Step bolts | 46 off |
| Plow bolts | 57 off |
| Lag bolts | |
| ¼ in. up to 1 in., 6 in. and shorter | 50 off |
| ¼ in. up to 1 in., longer than 6 in. | 48 off |

**Stove Bolts**
In packages, nuts separate, 65-10 off; bulk 75 off on 15,000 of 3-in. and shorter, or 5000 over 3-in., nuts separate.

**Nuts**

| Semifinished hexagon | A.S. Light | A.S. Reg. and Heavy |
|---|---|---|
| 7/16-in. and smaller | 51 off | .... |
| ½-in. and smaller | .... | 50 off |
| ½-in.-1-in. | 48 off | .... |
| 9/16-in.-1-in. | .... | 49 off |
| 1⅛-in.-1½-in. | 46 off | 47 off |
| 1⅝-in. and larger | .... | 40 off |

Additional discount of 15 for full containers.

**Hexagon Cap Screws**

| | |
|---|---|
| Upset 1-in., smaller (10-20 bright) | 56 off |
| Upset (10-35 heat treated) | |
| ⅝ x 6 | 51 off |
| ¾, ⅞, & 1 x 6 | 47 off |

**Square Head Set Screws**

| | |
|---|---|
| Upset 1-in. and smaller | 61 off |
| Headless, ¼-in. and larger | 46 off |
| No. 10 and smaller | 56 off |

## Rivets

Fob Pittsburgh, Cleveland, Chicago Birmingham

| | |
|---|---|
| Structural | 5.25c |
| Lebanon, Pa. | 5.40c |
| 7/16-in. and under | 55-5 off |
| Lebanon, Pa. | 55-5 off plus 15c per cwt. |

## Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl — $1.50-$2.00 off

## Tool Steels

**Tool Steel:** Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 16.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

| W | Cr | V | Mo | Base, per lb |
|---|---|---|---|---|
| 18.00 | 4 | 1 | ... | 74.00c |
| 1.5 | 4 | 1 | 8.5 | 59.00c |
| 12 | 3 | 0.50 | ... | 62.00c |
| 6.40 | 4.15 | 1.90 | 5 | 63.00c |
| 5.50 | 4.50 | 4 | 4.50 | 80.00c |

## Stainless Steels

Base, Cents per lb

| Grade | Bars, Drawn Wire, Structurals | Plate | Sheets | Hot Rolled Strip | Cold Rolled Strip |
|---|---|---|---|---|---|
| **CHROMIUM NICKEL STEELS** | | | | | |
| 301 | 26.00c | 29.50c | 37.00c | 22.00c | 28.00c |
| 302 | 26.00 | 29.50 | 37.00 | 23.50 | 30.50 |
| 303 | 28.50 | 31.50 | 39.00 | 29.50 | 36.00 |
| 304 | 27.50 | 31.50 | 39.00 | 25.50 | 32.50 |
| 308 | 31.50 | 37.00 | 44.50 | 31.00 | 38.00 |
| 309 | 39.00 | 43.50 | 51.00 | 40.50 | 51.00 |
| 310 | 53.50 | 56.50 | 57.50 | 53.00 | 61.00 |
| 316 | 43.50 | 48.00 | 52.00 | 43.50 | 52.00 |
| 321 | 31.50 | 37.00 | 44.50 | 32.00 | 41.50 |
| 347 | 36.00 | 41.50 | 49.00 | 36.00 | 45.50 |
| 431 | 21.00 | 24.00 | 31.50 | 19.00 | 24.50 |
| 440A | 26.00 | 31.00 | 36.50 | 26.00 | 30.50 |
| **STRAIGHT CHROMIUM STEEL** | | | | | |
| 403 | 23.50 | 27.00 | 32.00 | 23.00 | 29.50 |
| 410 | 20.50 | 23.50 | 29.00 | 18.50 | 24.00 |
| 416 | 21.00 | 24.00 | 29.50 | 20.00 | 25.50 |
| 420 | 26.00 | 31.00 | 36.50 | 26.00 | 39.50 |
| 430 | 21.00 | 24.00 | 31.50 | 19.00 | 24.50 |
| 430F | 21.50 | 24.50 | 32.00 | 20.50 | 27.00 |
| 442 | 24.50 | 28.00 | 35.50 | 26.00 | 35.00 |
| 443 | 24.50 | 28.00 | 35.50 | 26.00 | 35.00 |
| 446 | 30.00 | 33.00 | 39.50 | 38.00 | 56.50 |
| *501 | 9.00 | 13.00 | 17.50 | 13.00 | 18.50 |
| *502 | 10.00 | 14.50 | 18.50 | 14.50 | 19.50 |
| **†STAINLESS CLAD STEEL (20%)** | | | | | |
| 304 | .... | .... | 24.00 | 22.00 | .... | .... |
| 410 | .... | .... | 22.00 | 20.00 | .... | .... |
| 430 | .... | .... | 22.50 | 20.50 | .... | .... |
| 446 | .... | .... | 29.00 | 27.00 | .... | .... |

* Low chromium. † Fob Pittsburgh and Washington, Pa.; plate prices include annealing and pickling.

# RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax

## PIG IRON

| Prices per gross ton | No. 2 Foundry | Basic | Bessemer | Malleable |
|---|---|---|---|---|
| **Bethlehem, Pa.,** base | $34.50 | $34.00 | $35.50 | $35.00 |
| Newark, N. J., del. | 36.34 | 35.84 | 37.34 | 36.84 |
| Brooklyn, N. Y., del. | 37.50 | .... | .... | 38.00 |
| **Birdsboro, Pa.,** base | 34.50 | 34.00 | 35.50 | 35.00 |
| Philadelphia, del. | 36.02 | 35.52 | 37.02 | 36.52 |
| **Birmingham,** base | 29.88 | 29.38 | 34.50 | .... |
| Baltimore, del. | 36.28 | .... | .... | .... |
| Chicago, del. | 34.12 | .... | .... | .... |
| Cincinnati, del. | 34.75 | 34.25 | .... | .... |
| Newark, N. J., del. | 35.96 | .... | .... | .... |
| Philadelphia, del. | 35.13 | .... | .... | .... |
| St. Louis, del. | 33.87 | 33.37 | .... | .... |
| **Buffalo,** base | 33.00 | 32.50 | 34.00 | 33.50 |
| Boston, del. | 39.48 | 38.98 | 40.48 | 39.98 |
| Rochester, del. | 34.84 | 34.34 | 35.84 | 35.34 |
| Syracuse, del. | 35.50 | 35.00 | 36.50 | 36.00 |
| **Chicago,** base | 33.00 | 32.50 | 34.00 | 33.50 |
| Milwaukee, del. | 34.32 | 33.82 | 35.32 | 34.83 |
| Muskegon, Mich., del. | 36.83 | .... | .... | 37.33 |
| **Cleveland,** fob furnace | 33.00 | 32.50 | 34.00 | 33.50 |
| Akron, del. | 35.17 | 34.17 | 35.67 | 35.17 |
| **Duluth,** base | 33.50 | 33.00 | 34.50 | 34.00 |
| **Erie, Pa.,** base | 33.00 | 32.50 | 34.00 | 33.50 |
| **Everett, Mass.,** base | 29.50 | 29.00 | 30.50 | 30.00 |
| Boston, del. | 30.00 | 29.50 | 31.00 | 30.50 |
| **Granite City, Ill.,** base | 33.50 | 33.00 | .... | 33.50 |
| St. Louis, del. | 34.25 | 33.75 | .... | 34.25 |
| †**Neville Island, Pa.,** base | 33.50 | 33.00 | 34.00 | 33.50 |
| Pittsburgh, del., N. & S. Sides | 34.33 | 33.83 | 34.83 | 34.33 |
| **Provo, Utah,** base | 33.50 | 33.00 | .... | .... |
| Seattle, Tacoma, Wash., del. | 38.60 | .... | .... | .... |
| Portland, Oreg., del. | 38.60 | .... | .... | .... |
| **Sharpsville, Pa.,** base | 33.50 | 33.00 | 34.00 | 33.50 |
| **Steelton, Pa.,** base | 34.50 | 34.00 | 35.50 | 35.00 |
| **Swedeland, Pa.,** base | 35.50 | 35.00 | 36.50 | 36.00 |
| **Troy, N. Y.,** base | 34.50 | 34.00 | 35.50 | 35.00 |
| **Toledo, O.,** base | 33.00 | 32.50 | 34.00 | 33.50 |
| Cincinnati, del. | 36.50 | 36.00 | .... | .... |
| **Youngstown, O.,** base | 33.50 | 33.00 | 34.00 | 33.50 |
| Mansfield, O. | 36.48 | 35.98 | 36.98 | 36.48 |

† To Neville Island base add: 66c for McKees Rocks, Pa.; $1.01 Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Aliquippa; 97c (water), Monongahela; $1.33, Oakmont, Verona; $1.49 Brackenridge.

Exceptions to above prices: Kaiser-Frazer Parts Corp., Struthers, O., charges 50 cents a ton in excess of Sharpsville, Pa., basing point price for No. 2 foundry, basic, bessemer and malleable pig iron.

### Blast Furnace Silvery Pig Iron

| | | | |
|---|---|---|---|
| 6.00-6.50 per cent (base) | $42.50 | | |
| 6.51-7.00 | $43.50 | 9.01- 9.50 | 48.50 |
| 7.01-7.50 | 44.50 | 9.51-10.00 | 49.50 |
| 7.51-8.00 | 45.50 | 10.01-10.50 | 50.50 |
| 8.01-8.50 | 46.50 | 10.51-11.00 | 51.50 |
| 8.51-9.00 | 47.50 | 11.01-11.50 | 52.50 |

Fob Jackson, O., per gross ton; Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

### Bessemer Ferrosilicon

Prices same as for high silicon silvery iron, plus $1 per gross ton.

**Electric Furnace Silvery Pig Iron:** Si 14.01-14.50%, $61.75, Jackson, O.; $65, Niagara Falls; $66, piglets, $64, open-hearth and foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; $1 a ton for 0.045% max. phos.

### Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn... $40.50 (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

### Gray Forge

Neville Island, Pa. .....$33.00

### Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., Birdsboro, Pa., $39, base; Philadelphia, $41.16, del. Intermediate phosphorus, Central furnace, Cleveland, $36.

### Differentials

Basing point prices are subject to following differentials:

**Silicon:** An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

**Phosphorus:** A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

**Manganese:** An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

**Nickel:** An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

## Metallurgical Coke

Price Per Net Ton

### Beehive Ovens

| | |
|---|---|
| Connellsville, furnace | *$9.50–$10.50 |
| Connellsville, foundry | 9.75–12.00 |
| New River, foundry | 12.50 |
| Wise county, foundry | 11.15 |
| Wise county, furnace | 10.65 |

* Operators of hand-drawn ovens using trucked coal, $10.10-$11.10.

### Foundry Coke

| | |
|---|---|
| Kearney, N. J., ovens | $15.35 |
| Chicago, outside del. | 15.10 |
| Chicago, del. | 16.10 |
| Terre Haute, del. | 15.60 |
| Milwaukee, ovens | 15.85 |
| New England, del. | 17.25 |
| Birmingham, Del. | 13.25 |
| Indianapolis, ovens | 14.50 |
| Cincinnati, del. | 15.35 |
| Ironton, O., ovens | 13.35 |
| Painesville, ovens | 14.60 |
| Cleveland, del. | 15.90 |
| Buffalo, del. | 16.10 |
| Detroit, del. | 15.75 |
| Philadelphia, ovens | 14.50 |
| Portsmouth, O., ovens | 14.00 |
| Fairmont, W. Va., ovens | 13.75 |
| Pittsburgh, del. | 15.61 |

## Coal Chemicals

Spot, gal, freight allowed east of Omaha. Effective as of Apr. 1, 1947

| | |
|---|---|
| Pure and 90% benzol | 19.00c |
| Toluol, two degrees | 23.00c |
| Industrial xylol | 23.00c |
| Solvent naphtha | 26.00c |
| **Per pound fob works** | |
| Phenol (car lots, returnable drums) | 11.25c |
| Do., less than carlots | 12.00c |
| Do., tank cars | 10.25c |
| **Eastern plants, per pound** | |
| Naphthalene flakes, balls, bbl, to jobbers, "house-hold use" | 9.50c |
| **Per ton, bulk, fob plants** | |
| Sulphate of ammonia | $30.00 |

## Refractories

Per 1000, fob shipping point Net Prices

### Fire Clay Brick

Super Duty

| | |
|---|---|
| Pa., Mo., Ky. | $87.00 |

High Heat Duty

| | |
|---|---|
| Pa., Ill., Md., Mo., Ky. | 70.00 |
| Ala., Ga. | 70.00 |
| N. J. | 76.00 |

Intermediate Heat Duty

| | |
|---|---|
| Ohio | 64.00 |
| Pa., Ill., Md., Mo., Ky. | 64.00 |
| Ala., Ga. | 56.00 |
| N. J. | 67.00 |

Low Heat Duty

| | |
|---|---|
| Pa., Md., Ohio | 56.00 |

### Ladle Brick

(Pa., O., W. Va., Mo.)

| | |
|---|---|
| Dry Press | 47.00 |
| Wire Cut | 45.00 |

### Malleable Bung Brick

| | |
|---|---|
| All bases | 80.00 |

### Silica Brick

| | |
|---|---|
| Pennsylvania | 70.00 |
| Joliet, E. Chicago | 79.00 |
| Birmingham, Ala. | 70.00 |

### Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.

| | |
|---|---|
| Bulk | 24.00 |
| Single bags | 28.00 |

### Basic Brick

Net tons, fob Baltimore, Plymouth Meeting, Chester, Pa.

| | |
|---|---|
| Chrome brick | 59.00 |
| Chem. bonded chrome | 59.00 |
| Magnesite brick | 81.00 |
| Chem. bonded magnesite | 70.00 |

## Ores

### Lake Superior Iron Ore

*Gross ton, 51½% (Natural) Lower Lake Ports*

| | |
|---|---|
| Old range bessemer | $5.95 |
| Old range nonbessemer | 5.80 |
| Mesabi bessemer | 5.70 |
| Mesabi nonbessemer | 5.55 |
| High phosphorus | 5.55 |

### Eastern Local Ore

*Cents, units, del. E. Pa.*

| | |
|---|---|
| Foundry and basic 56-63% contract | 15.25 |

### Foreign Ore

*Cents per unit, cif Atlantic ports*

| | |
|---|---|
| No. African low phos. | Nom. |
| Swedish basic, 60 to 68% | 13.50 |
| Spanish, No. African basic, 50 to 60% | Nom. |
| Brazil iron ore, 68-69% fob Rio de Janeiro, nom. | 5.50–6.50 |

### Tungsten Ore

| | |
|---|---|
| Wolframite and scheelite per short ton unit, duty paid | $32–$34 |

### Manganese Ore

46-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 63.00c-67.00c.

### Chrome Ore

*Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Oreg., or Tacoma, Wash.*

*(S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)*

| | |
|---|---|
| Indian and African | |
| 48% 2.8:1 | $37.50 |
| 48% 3:1 | 39.00 |
| 48% no ratio | 31.00 |
| South African (Transvaal) | |
| 44% no ratio | $27-$27.50 |
| 45% no ratio | 28.00 |
| 48% no ratio | 30.00 |
| 50% no ratio | 31.00 |
| Brazilian—nominal | |
| 44% 2.5:1 lump | $33.65 |
| 48% 3:1 lump | 43.50 |
| Rhodesian | |
| 45% no ratio | $27-$27.50 |
| 48% no ratio | 30.00 |
| 48% 3:1 lump | 39.00 |
| Domestic (seller's nearest rail) | |
| 48% 3:1 | $39.00 |

### Molybdenum

| | |
|---|---|
| Sulphide conc., lb., Mo. cont., mines | $0.75 |

## Fluorspar

Metallurgical grade, fob shipping point in Ill., Ky., net tons, carloads, effective $CaF_2$ content, 70% or more, $33; 65% to 70%, $32; 60% to 65%, $31; less than 60%, $30.

## HIGH-STRENGTH—LOW-ALLOY STEELS

Prices in dollars per 100 pounds

| | Pittsburgh | Chicago | Gary | Youngstown | Sparrows Point | Buffalo | Bethlehem | Canton | Massillon |
|---|---|---|---|---|---|---|---|---|---|
| Sheets, Hot-Rolled | 3.85 | 3.85 | 3.85 | 3.85 | 3.85 | 3.85 | ... | ... | ... |
| Cold-Rolled | 4.75 | 4.75 | 4.75 | 4.75 | ... | 4.75 | ... | ... | ... |
| Galvanized | 5.40 | ... | ... | ... | ... | ..... | ... | ... | ... |
| Strip, Hot-Rolled | 3.85 | 3.85 | 3.85 | 3.85 | ... | ..... | ... | ... | ... |
| Cold-Rolled | 4.55 | 4.65 | 4.65 | 4.65 | ... | ..... | ... | ... | ... |
| Shapes, Structural | 3.85 | 3.85 | ..... | 3.85 | ... | ..... | 3.85 | ... | ... |
| Plates | 4.10 | 4.10 | 4.10 | ... | 4.10 | ..... | ... | ... | ... |
| Bars and Bar Shapes | 4.00 | 4.00 | 4.00 | 4.00 | ... | 4.00 | ... | 4.00 | 4.00 |

# WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras

| | SHEETS | | | | | STRIP | | BARS | | | | PLATES | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H-R 10G | C-R 10G | C-R 17G | Gal. •10G | Gal. •24G | †H-R | †C-R | H-R Rds. ⅝" to 3" | C-F Rds. ½"& up | H-R Alloy (f4140) | Structural Shapes | Carbon ⅜"-¾" | Floor ⅜" & Thicker |
| Boston (City) | 4.50 | 5.67[4] | 5.22[4] | 5.55[4] | 6.80[4] | 4.65 | 6.36 | 4.62 | 5.22 | 7.12 | 4.47 | 4.70 | 6.42 |
| ††New York (city) | 4.42 | .... | 5.27[5] | 5.47[5] | .... | 4.62 | .... | 4.62 | 5.17 | 8.42[19] | 4.37 | 4.72 | 6.35 |
| New York (country) | 4.32 | .... | 5.17[5] | 5.37[5] | .... | 4.52 | .... | 4.52 | .... | .... | 4.27 | .... | 6.25 |
| Philadelphia (city) | 4.34 | 5.78[9] | 5.33[9] | 5.29[9] | 6.54[5] | 4.43 | 5.28 | 4.48 | 5.13 | 6.87 | 4.22 | 4.44 | 5.93 |
| Philadelphia (country) | 4.24 | 5.63[9] | 5.23[9] | 5.19[9] | 6.44[5] | 4.33 | 5.18 | 4.38 | .... | 6.60 | 4.12 | 4.34 | 5.83 |
| Baltimore (city) | 4.09 | 6.15[5] | 5.65[5] | 5.14[5] | 6.39[5] | 4.40 | .... | 4.45 | 5.10 | .... | 4.34 | 4.39 | 5.90 |
| Baltimore (country) | 3.59 | 6.05[5] | 5.55[5] | .... | .... | .... | .... | .... | .... | .... | 4.24 | 4.29 | 5.80 |
| Washington (city) | 4.35 | .... | .... | 5.18[5] | 6.43[5] | 4.65 | .... | 4.70 | 5.60[11] | .... | 4.60 | 4.65 | 6.60 |
| Norfolk, Va. | 4.35 | | | | | .... | .... | 4.75 | 5.50 | .... | 4.50 | 4.50 | 6.25 |
| Buffalo (city) | 4.15 | .... | 4.85[6] | 5.35[5] | .... | 4.30 | 5.25 | 4.10 | 4.75 | | 4.10 | 4.55 | 5.90 |
| Buffalo (country) | 4.00 | .... | 4.70[6] | 4.95[5] | .... | 3.90 | 4.85 | 3.95 | 4.60 | 6.60 | 3.95 | 4.10 | 5.45 |
| Pittsburgh (city) | 3.95† | .... | 4.75[8]† | 5.10[8] | 6.35[5] | 4.05 | 5.00 | 4.10 | 4.75 | 6.60 | 4.10 | 4.25 | 5.60 |
| Pittsburgh (country) | 3.80† | .... | 4.60[8]† | 4.95[5] | 6.20[5] | 3.90 | 4.85 | 3.95 | 4.60 | 6.60 | 3.95 | 4.10 | 5.45 |
| Youngstown, O. (city) | 4.188 | 5.338 | 4.888 | 5.05 | 6.30 | 4.00 | .... | 4.238 | 5.138 | .... | 4.218 | 4.488 | 5.178 |
| Youngstown, O. (country) | .... | .... | .... | 4.95 | 6.20 | 3.90 | .... | .... | .... | .... | .... | .... | .... |
| Detroit | 4.05 | 5.30 | 4.85‡ | 5.42 | 6.67 | 4.34 | 5.24 | 4.20 | 4.87[13] | 7.01 | 4.42 | 4.49 | 5.92 |
| Cleveland (city) | 4.15 | 5.15[5] | 4.85[5] | 5.238[5] | 6.488[5] | 4.188 | 5.10 | 4.10 | 4.75 | 6.858 | 4.311 | 4.25 | 5.961 |
| Cleveland (country) | 4.00 | 5.00[5] | 4.70[5] | .... | .... | 3.90 | 4.95 | 3.95 | 4.60 | .... | .... | 4.10 | .... |
| Cincinnati | 4.016 | 4.816[5] | .... | 5.166[5] | 6.416[5] | 4.394 | .... | 4.403 | 5.053 | .... | 4.444 | 4.553 | 5.944 |
| Chicago (city) | 4.15 | 5.15[5] | 4.85[5] | 5.10[5] | 6.35[5] | 4.05 | 5.10 | 4.10 | 4.75 | 6.60[13] | 4.10 | 4.25 | 5.75 |
| Chicago (country) | 4.00 | 5.00[5] | 4.70[5] | 4.95[5] | 6.20[5] | 3.90 | 4.95 | 3.95 | 4.60 | 6.60[13] | 3.95 | 4.10 | 5.60 |
| Milwaukee | 4.299 | 5.299[5] | 4.999[5] | 5.249[5] | 6.499[5] | 4.199 | 5.249 | 4.249 | 4.899 | 6.899 | 4.249 | 4.399 | 5.899 |
| St. Paul, Minneapolis | 4.284[18] | .... | 5.084[8]† | 5.434[5] | 6.684[5] | 4.384[18] | .... | 4.434[18] | 5.476[11] | 7.084[11] | 4.434[18] | 4.584[18] | 6.084[18] |
| Indianapolis | 4.04 | .... | 4.84[5] | 5.29[5] | 6.54[5] | 4.24 | .... | 4.36‡‡ | 5.26 | .... | 4.36 | 4.61 | 6.01 |
| St. Louis | 4.699 | .... | 4.899[9]† | 5.424[5] | 6.674[5] | 4.199 | .... | 4.249 | 5.074[12] | 7.074 | 4.249 | 3.999 | 5.899 |
| Birmingham (city) | 3.85[20] | .... | .... | 5.20[5] | .... | 4.10[20] | .... | 4.05[20] | 5.58 | .... | 4.05 | 4.30 | 6.56 |
| Birmingham (country) | 3.75[20] | .... | .... | 5.10[5] | | 4.00[20] | .... | 3.95[20] | .... | .... | 3.95 | 4.20 | .... |
| New Orleans | 4.68[20]•• | .... | 5.94[5] | .... | .... | 4.88[20] | .... | 4.83[20]••• | 5.94[11] | .... | 4.73[20]••• | 5.03[20] | 6.99[20] |
| Houston, Tex. | 6.00[1] | .... | .... | 6.00 | .... | 6.00[1] | .... | 5.35[1] | .... | 6.35 | 5.85 | 5.85 | 6.40 |
| Omaha, Nebr. | 4.868 | 6.118[5] | .... | 5.918[5] | 7.168[5] | 4.862 | .... | 4.918 | 5.818[11] | .... | 4.918 | 5.068 | 6.568 |
| Los Angeles | 5.35 | .... | 7.00[5] | .... | 7.45[5] | 5.65 | 8.35 | 5.10 | 6.90[19] | 9.35 | 5.20 | 5.10 | 7.20 |
| San Francisco | 4.90[21] | .... | 6.30[5] | .... | 7.35[5] | 5.20[14] | 8.35[14] | 4.75[14] | ••• | 9.35[18] | 4.90[14] | 5.00[14] | 6.80[14] |
| Seattle and Tacoma, Wash. | 5.00[17] | .... | 6.75[5] | 6.30[5] | .... | 5.30[17] | .... | 5.00[17] | 7.10[19] | 8.50[13] | 4.95[17] | 5.15[17] | 7.25[17] |

**Base Quantities:** 400 to 1999 pounds except as noted: Cold-rolled strip, 2000 lb and over, cold finished bars, 1000 pounds and over; [1]—any quantity; [2]—300 to 1999 pounds; [3]—150 to 2249 pounds; [4]—three to 24 bundles; [5]—450 to 1499 pounds; [6]—one bundle to 1499 pounds; [7]—one to nine bundles; [8]—400 to 1499 pounds; [9]—1000 to 1999 pounds; [10]—450 to 39,999 pounds; [11]—1000 to 39,999 pounds; [12]—1000 pounds and over; [13]—400 to 14,999 pounds; [14]—400 to 39,999; [15]—2000 lb and over; [16]—1000 to 4999; [17]—300 to 9999 pounds; [18]—1500 to 1999 pounds; [19]—1500 to 39,999; [20]—400 to 3999 pounds; [21]—400 lb and over.

• Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § as rolled, except New York, Jersey City, Indianapolis and San Francisco where price represents annealed bars; •• add 0.46 for sizes not rolled in Birmingham; †† same prices quoted for Jersey City, N. J.; ‡‡ add 15c for 100 lb for slow moving items; §§ 18 gage and heavier; ••• rounds under ⅝ in. 7.00c, ⅝ in. and over 6.50c, squares, hexagons and flats 6 in. and narrower 7.50c, flats over 6 in. 8.25c at San Francisco.

# PRICES OF LEADING FERROALLOYS PRODUCTS

**Spiegeleisen:** 19-21% Mn, 1-3% Si, carlot per gross ton, Palmerton, Pa., $44, Pittsburgh, $48. 16% to 19% Mn, Pittsburgh, $47.

**Ferromanganese,** standard: 78-82% c.l. gross ton, duty paid, $135 fob cars, Baltimore, Philadelphia or New York, whichever is most favorable to buyer, Birmingham, Ala. (where Sloss-Sheffield Steel & Iron Co. is producer); $140.25 fob cars, Pittsburgh, including 75c switching charge, (where Carnegie-Illinois Steel Corp. is producer); add $8 for packed c.l., $10 for ton, $13.50 for less ton; $1.70 for each 1%, or fraction contained manganese over 82% or under 78%.

**Ferromanganese, low carbon:** Eastern zone: Special, 21c; regular, 20.50c; medium, 14.50c; central zone: Special, 21.30c; regular, 20.80c; medium, 14.80c; western zone: Special, 21.30c; regular, 21.20c; medium, 15.20c. Prices are per pound contained Mn, bulk carlot shipments, fob shipping point, freight allowed. Special low-carbon has content of 90% Mn, 0.10% C, and 0.06% P.

**Ferromanganese Briquets:** (Weight approx. 3 lb and containing exactly 2 lb Mn) Prices per lb of briquets: Contract, bulk, carlots, 7.00c, packed, carlots, 7.60c, ton lots, 8.00c, smaller lots 8.40c, eastern, freight allowed; 7.25c, 7.85c, 8.60c and 9.00c, central; 7.80c, 8.40c, 10.50c and 10.90c, western; spot up 0.25c; notched, up 0.25c.

**Ferrotungsten:** Spot, 10,000 lb or more, per lb contained W, $2.27; contract, $2.25; freight allowed as far west as St. Louis.

**Ferrotitanium:** 40-45%, R.R. freight allowed, per lb contained Ti; ton lots $1.23; smaller lots $1.25; eastern. Spot up 5c per lb.

**Ferrotitanium:** 20-25%, 0.10 maximum C; per lb contained Ti; ton lots $1.35; smaller lots $1.40 eastern. Spot up 5c per lb.

**Ferrotitanium, High-Carbon:** 15-20% contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

**Ferrovanadium:** V 0.35-0.55%, contract basis, per lb contained V, fob producers plant with usual freight allowances; open-hearth grade $2.70; special grade $2.80; highly-special grade $2.90.

**Ferromolybdenum:** 55-75% per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.

**Ferrophosphorus:** 17-19%, based on 18% P content with unitage of $3 for each 1% of P above or below the base; gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

**Ferrosilicon:** Contract, lump, packed; eastern zone quotations: 90-95% c.l. 13.80c, ton lots 14.30c, smaller lots 14.80c; 75%, c.l. 11.05c, ton lots 11.65c, smaller lots 12.25c; 50%, c.l. 9.00c, ton lots 9.65c, smaller lots 10.30c. Deduct 1.00c for bulk, carlots, 80-90% and 90-95%; 1.05c, 75%; 1.20c, 50%. Prices are fob shipping point, freight allowed, per lb of contained Si. Spot prices 0.25c higher on 80-90%, 0.30c on 75%, 0.45c on 50%.

**Ferroboron:** (B 17.50% max. and C 1.50% max., Al 0.50% max. and C 0.50% max.) Prices per lb of alloy, contract, ton lots $1.20, smaller lots $1.30, eastern, freight allowed; $1.2075 and $1.3075 central; $1.229 and $1.329, western; spot add 5c.

**Ferrocolumbium:** 50-60%, per lb contained columbium in gross ton lots, contract basis, R. R. freight allowed, eastern zone, $2.50; smaller lots $2.55. Spot up 10c.

**Ferrochrome:** Contract, lump, packed; **high carbon,** eastern zone, c.l. 16.20c, ton lots 16.80c; central zone, add 0.40c and 1.30c; western zone, add 0.55c and 2.10c. Deduct 0.60c for bulk carlots. **High carbon, high nitrogen,** add 5c to all high carbon ferrochrome prices. Deduct 0.55c for bulk carlots. Spot prices up 0.25c. **Low carbon,** eastern zone, bulk, c.l., max. 0.06% C 23c; 0.1% 22.50c, 0.15% 22.00c, 0.2% 21.75c; 0.5% 21.50c, 1% 21.00c, 2% 20.50c; add 1.35c for 2000 lb to c.l.; central zone, add 0.4c for bulk, c.l.; and 0.65c for 2000 lb to c.l.; western zone, add 0.5c for bulk, c.l., and 1.85c for 2000 lb to c.l.; carlot packed differential 0.80c. Prices are per lb of contained Cr, freight allowed.

**Low carbon, high nitrogen:** Add 2c to low carbon ferrochrome prices. For higher nitrogen low carbon, add 2c for each 0.25% of nitrogen over 0.75%.

**Ferrochrome, Special Foundry:** (Cr 62-66%, C above 5-7%.) Contract, 2-inch x D, packed, eastern zone, freight allowed, c.l. 17.05c, ton lots 17.60c, smaller lots 18.30c; central zone, add 0.40c for c.l. and 1.30c for smaller lots; western zone, add 0.55c for c.l. and 2.10c for smaller lots. Deduct 0.60c for bulk carlots. **S. M. Ferrochrome, high carbon:** (Cr 60-65%, Si, Mn and C 4-6% each.) Contract, lump, packed, eastern zone, freight allowed, c.l. 17.30c, ton lots 17.90c, smaller lots 18.60c; central zone, add 0.40c for c.l. and 1.30c for smaller lots; western zone, add 0.55c for c.l. and 2.10c for smaller lots. Prices are per pound of contained chromium, spot prices 0.25c higher. Deduct 0.60c for bulk carlots.

**S. M. Ferrochrome, low carbon:** (Cr 62-66%, Si 4-6%, Mn 4-6% and C 1.25% max.) Contract, carlot, bulk 21.00c; packed carlot 21.80c, ton lots 22.35c, smaller lots 23.35c, eastern, freight allowed, per pound of contained Cr; 21.40c, 22.20c, 23.00c, and 24.00c, central; 21.50c, 22.30c, 24.20c and 25.20c, western spot up 0.25c.

**Ferrochrome Briquets:** Containing exactly 2 lb Cr, packed eastern zone, c.l. 10.35c, ton lots 10.75c, smaller lots 11.15c; central zone, add 0.25c for c.l. and 0.90c for smaller lots; western zone, add 0.55c for c.l. and 2.10c for smaller lots. Deduct 0.50c for bulk carlots. Prices per pound of briquets; spot prices 0.25c higher; notched 0.25c higher.

**Chromium Metal:** 97% min. Cr, max. 0.50% C, eastern zone, per lb contained Cr bulk, c.l. 79.50c, 2000 lb c.l. 80c; central 81c and 82.60c; western 82.25c and 84.75c, fob shipping point, freight allowed.

**Chromium-Copper:** (Cr 8-11%, Cu 88-90%, Fe 1% max., Si 0.50% max.) Contract, any quantity, 45c, eastern, Niagara Falls, N. Y., basis, freight allowed to destination, except to points taking rate in excess of St. Louis rate to which equivalent of St. Louis rate will be allowed; spot up 2c.

**Calcium metal; cast:** Contract, ton lot or more, $1.60; 100 to 1999 lb, $1.95; less than 100 lb, $3.15 per lb of metal, eastern zone; $1.615, $1.965 and $3.185, western; spot up 5c.

**Calcium-Manganese-Silicon:** (Ca 16-20%, Mn 14-18% and Si 53-59%), per lb of alloy. Contract, carlots, packed, 16.10c, ton lots 17.60c, smaller lots 18.60c, eastern, freight

allowed; 16.60c, 18.45c, 19.45c, central; 18.65c, 20.20c, 21.20c, western; spot up 0.25c.

**Calcium - Silicon:** (Ca 30-35%, Si 60-65% and Fe 3.00% max.), per lb of alloy. Contract, lump, packed, carlots 14.60c, ton lots 16.10c, smaller lots 17.10c, eastern, freight allowed; 15.10c, 16.85c, 17.85c, central; 17.15c, 19.00c, 20.00c, western; spot up 0.25c.

**Silicon Metal:** Min. 97% Si and max. 1% Fe, eastern zone, bulk, c.l. 14.50c; 2000 lb to c.l. 16.00c; central zone, 15.10c and 18.25c; western, 15.70c and 20.00c; min. 96% Si and max. 2% Fe, eastern, bulk, c.l., 14.10c; 2000 lb to c.l. 15.60c; central, 14.70c and 17.85c; western, 15.30c and 19.60c, fob shipping point, freight allowed. Price per lb contained Si.

**Silicomanganese Briquets:** Containing exactly 2 lb Mn and about ½ lb Si, eastern zone, bulk, c.l. 6.75c, ton lots 7.75c; central zone, add 0.25c for c.l. and 0.60c for ton lots; western, add 0.80c for c.l. and 2.50c for ton lots. Notched, up 0.25c.

**Silicon Briquets:** Weighing about 5 lb and containing exactly 2 lb Si, packed, eastern zone, c.l. 4.70c, ton lots 5.10c, smaller lots 5.50c; weighing about 2½ lb and containing 1 lb Si, packed, eastern zone, c.l. 4.85c, ton lots 5.25c, smaller lots 5.65c; notched 0.25c higher; central zone, add 0.25c for c.l. and 0.60c for smaller lots; western zone, add 0.45c for c.l. and 0.90c for smaller lots. Prices are fob shipping point, freight allowed; spot prices 0.25c higher. Deduct 0.50c for bulk carlots.

**Manganese Metal:** (Min. 96% Mn., max. 2% Fe), per lb of metal, eastern zone, bulk, c.l. 30c, 2000 lb to c.l., 32.00c; central 31.00c and 33.45c; western, 31.45c and 34.40c.

**Electrolytic Manganese:** 99.9% plus, fob Knoxville, Tenn., freight allowed east of Mississippi on 250 lb or more: Carlots 32c, ton lots 34c, drum lots 36c, less than drum lot 38c. Add 1½c for hydrogen-removed metal.

**Manganese-Boron:** (Mn 75% approx., B 15-20%, Fe 5% max., Si 1.50% max. and C 3% max.) Prices per lb of alloy. Contract, ton lots $1.89, less $2.01, eastern, freight allowed; $1.903 and $2.023, central; $1.935 and $2.055, western; spot up 5c.

**Nickel-Boron:** (B 15-18%, Al 1% max., Si 1.50% max., C 0.50% max., Fe 3% max., Ni, balance). Prices per lb of alloy: Contract, 5 tons or more $1.90, 1 ton to 5 tons $2.00, smaller lots $2.10, eastern, freight allowed; $1.9125, $2.0125 and $2.1125, central; $1.9445, $2.0445 and $2.1445, western; spot same as contract.

**Borosil:** 3 to 4% B, 40 to 45% Si; $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

**Bortam:** B 1.5-1.9%, ton lots, 45c per lb; smaller lots, 50c per lb.

**Carbortam:** B 0.90 to 1.15% net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

**Silicaz Alloy:** (Si 35-40%, Ca 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%) Prices per lb of alloy, contract, or spot carlots 35.00c, ton lots 37.00c, smaller lots 39.00c, eastern, freight allowed; 35.30c, 38.10c and 40.10c, central; 35.30c, 40.05c and 42.05c, western; spot up 0.25c.

**SMZ Alloy:** (Si 60-65%, Mn 5-7%, Zr 5-7% and Fe approx. 20%) Prices per lb of alloy, contract, carlots 13.50c, ton lots 14.25c, smaller lots 15.00c, eastern zone, freight allowed; 13.80c, 15.35c, 16.10c, central; 13.80c, 17.30c, 18.05c, western; spot up 0.25c.

**CMSZ Alloys 4 & 5:** (Alloy 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3.00-4.50%; alloy 5—Cr 50-56%, Mn 4-6%, 13.50-16.00%, Zr 0.75-1.25%, C 3.50-5.00%). Prices per lb of alloy, contract or spot, bulk, carlots 14.50c; packed, carlots 15.25c, ton lots 16.00c, smaller lots 16.75c, eastern, freight allowed; 14.80c, 15.55c, 17.10c, 17.85c, central; 14.80c, 15.55c, 19.05c, 19.80c, western.

**Zirconium alloy:** 12-15%, per lb of alloy, eastern, contract, bulk, carlots 5.50c, packed, carlots 6.05c, ton lots 6.40c, smaller lots 6.75c; spot up 0.25c.

**Zirconium alloy:** Z 35-40%, eastern, contract, packed, carlots 17.00c, ton lots 17.75c, smaller lots 19.00c; spot up 0.25c.

**Alsifer:** (Approx. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb 6.25c; ton lots 6.75c; smaller lots 7.25c. Spot up ½c.

**Simanal:** (Approx. 20% each Si, Mn, Al) Packed, lump, carload 9c, ton lots 9.25c, smaller lots 9.75c per lb alloy; freight not exceeding St. Louis rate allowed.

**Tungsten Metal Powder:** Spot, not less than 98.8%, $2.90, freight allowed as far west as St. Louis.

**Grainal:** Vanadium Grainal No. 1 87.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

**Vanadium Pentoxide,** technical grade: Fused, approx. 89-92% $V_2O_5$ and 5.84% $Na_2O$; or air dried, 83-85% $V_2O_5$ and 5.15% $Na_2O$, $1.10 per lb contained $V_2O_5$ fob plant freight allowed on quantities of 25 lb and over to St. Louis.

# Brass and Bronze Ingot Prices Reduced

*Declines, ranging up to 1¾ cents, reflect drop in scrap metal prices . . . Major markets hold firm*

**NEW YORK**—Reductions ranging up to 1¾ cents a pound in brass and bronze ingot prices featured the nonferrous metal markets last week. These revisions brought the market in line with current red metal scrap prices which have declined rather sharply in recent weeks. Platinum prices dropped $3 while silver advanced to 60.75c, 1 cent above the price established at the close of the preceding week which was the lowest recorded since Sept. 21, 1945. Weakness in brass and platinum was attributed generally to the decline in consumer demand.

Undertone of the major nonferrous markets remained steady on sustained demand.

**BRASS AND BRONZE INGOTS**—Brass and bronze ingot prices were reduced as follows on June 24: Ingots in the 85-5-5-5 group, 1½ cents; some items in the 88-10-2 group, ½-cent, some 1 cent, and others 1½ cents; the first three items in the 80-10-10 group, 1 cent, remaining items in the group, 1½ cents, except ingot No. 315 which was cut 1¾ cents; ingots in the yellow group, 1¼ cents; ingots in the miscellaneous group, from 1 to 1½ cents, except Nos. 423 and 424 which were unchanged. Ingot makers' shipments held up fairly well during the first four months of the year, but have declined rather sharply during the last two months.

**BRASS MILL PRODUCTS:** Leading brass mill fabricators are refunding to customers the difference, if any, between the prices charged for their products within the period beginning May 26 to June 10 and the prices quoted June 11. The effect of this action is that all June sales are priced on the basis of 21.50-cent copper, rather than a range of 21.50 to 23-cent copper.

**COPPER**—Consumption of copper by copper and brass mill fabricators declined 3350 tons during May to a total of 118,050 tons and compared with 93,007 tons in May of last year. Total deliveries by primary producers and importers increased to 122,868 tons in May from 120,089 tons in April. Copper industry invoicings in May amounted to 110,543 tons, or an increase of about 12,000 tons over the preceding month. The industry's sales increased to 137,796 tons, a rise of 60,700 tons. Consumers' sales also underwent a substantial increase of about 40,000 tons to a total of 122,469 tons.

Total stocks of refined copper held by the fabricators increased about 5800 tons to 408,872 tons while their unfilled purchases increased 27,000 tons to 86,697 tons. Fabricators' working stocks declined 7000 tons to 277,223 tons, while unfilled orders held steady at 469,662 tons. This resulted in a deficit in the consumers' sales position of 251,316 tons, or about 37,400 tons less than a month earlier and about 100,000 tons below the deficit reported a year ago.

Amount of refined copper in the government's stockpile on May 31 totaled 15,926 tons, a drop of 715 tons for the month. The stockpile will disappear completely within the next few months, since about 8500 tons were allocated to consumers in June, leaving only about 7500 tons.

The primary copper market was firm last week at 21.50c, Connecticut, with heavy demand for July shipments. Consumers were unable to cover their needs and some wire mills, particularly short of supplies, paid as high as 21.75c for prompt shipment.

**LEAD**—Production of refined lead in the United States from primary and secondary sources totaled 53,822 tons in May, compared with 53,424 tons in April, according to the American Bureau of Metal Statistics. Total production in the first five months totaled 248,167 tons, a sharp increase over the 161,329 tons produced in the like 1946 period. Production of antimonial lead declined to 9828 tons in May from 12,843 in April.

Shipments of refined lead to domestic consumers declined slightly to 50,482 tons from 50,568 tons in April, making total for the first five months 248,041 tons compared with 167,426 in the like period a year ago. Cable makers received only 5975 tons in May compared with 10,713 tons in April, the decline being due to the shutdown of one of the largest cable maker's plants by a strike during most of the month. Battery makers received 7947 tons in May compared with 7760 in April while unclassified consumers received 28,467 tons against 23,631 in April.

Stocks of lead at refineries amounted to 47,233 tons at the end of May, an increase of about 2400 tons from the Apr. 30 figure.

**ZINC**—Trading in zinc futures on the Commodity Exchange will be resumed on July 22. Last trading was on Mar. 3, 1941, at which time prices stood at 11.00c for May, 1941, delivery and 9.75c for August, 1941, delivery. Each contract will call for delivery of 60,000 pounds of zinc in slabs of a grade equal in quality to that specified by the American Society for Testing Materials. First delivery month in restored trading will be September, 1947, and all subsequent months to June, 1948. The Exchange's limitation of 1 cent a pound, up or down, in any one trading day will be suspended for the reopening day, but will be restored on July 23.

Government's stockpile of zinc, as of May 31, totaled 413,371 tons, or an increase of about 10,000 tons over the total at the end of the preceding month.

**TIN**—Reconstruction Finance Corp. has purchased an additional 1800 tons of Straits tin from the British Ministry of Supply, making a total of 4800 tons purchased during the first half of this year for shipment from Malaya. RFC has purchased also an additional 700 tons of refined tin which is available for prompt shipment from Belgium. With respect to Siamese tin, 1300 tons have been shipped and 1200 tons are under contract for shipment to this country.

# NONFERROUS METAL PRICES

**Copper:** Electrolytic, carlots 21.50c, delivered Conn.; Lake, 21.62½c, del. Conn. Dealers may add ¾c for 5000 lb to carload; 1c, 1000-4999 lb; 1½c, 500-999 lb; 2c, 0-499 lb. Casting, nom., refinery, 20,000 lb or more; nom., less than 20,000 lb.

**Brass Ingot:** 85-5-5-5 (No. 115) 18.00c; 88-10-2 (No. 215) 26.25c; 80-10-10 (No. 305) 22.00c; No. 1 yellow (No. 405) 14.50c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than carloads.

**Zinc:** Prime western 10.50c, brass special 10.75c, intermediate 11.00c, E. St. Louis; high grade 11.50c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

**Lead:** Common 14.80c-14.85c, chemical 14.90c, corroding 14.90c, E. St. Louis for carlots.

**Primary Aluminum:** 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ½c 2000-9999 lb; 1c less through 2000 lb.

**Secondary Aluminum:** Piston alloy (No. 122 type) 13.75c; No. 12 foundry alloy (No. 2 grade) 13.25c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 14.50c; grade 2 (92-95%) 12.50c; grade 3 (90-92%) 11.75c; grade 4 (85-90%) 11.00c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

**Magnesium:** Commercially pure (99.8%) standard ingots (4-notch, about 20 lb), 10,000 lb and over, 20.50c; 2000 to 9999 lb, 21.50c; 100 to 1999 lb, 22.50c. Extruded rounds, 12 inches long, 1.312 inches in diameter, less than 25 lb, 52.00c-56.00c; 25 to 99 lb, 42.00c-46.00c; 100 to 4000 lb, 35.00c-36.00c.

**Tin:** Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straits), 80.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 79.85c; Grade C, 99.65-99.79% incl. 79.55c; Grade D, 99.50-99.64% incl., 79.40c; Grade E, 99-99.49% incl. 78.90c; Grade F, below 99% (for tin content), 78.70c.

**Antimony:** American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 33.00c; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 33.50c, effective as of Mar. 15. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 9999-224 lb; add 2c for 223 lb and less; on sales by dealers, distributors, and jobbers add ½c, 1c, and 3c, respectively.

**Nickel:** Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked 35c lb; 25 lb pigs produced from electrolytic cathodes 36.50c lb; shot produced from electrolytic cathodes 37.50c lb; "F" nickel shots or ingots for additions to cast iron 35.50c lb. Prices include import duty.

**Mercury:** Open market, spot, New York, $84-$87 per 76-lb flask.

**Arsenic:** Prime, white, 99%, carlots, 4.00c lb.

**Beryllium-Copper:** 3.75-4.25% Be, $14.75 per lb contained Be.

**Cadmium:** Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms $1.75 lb, del.; anodes, balls, discs and all other special or patented shapes, $1.80.

**Cobalt:** 97-98%, $1.50 lb for 550 lb (keg); $1.52 lb for 100 lb (case); $1.57 lb under 100 lb.

**Gold:** U. S. Treasury, $35 per ounce.

**Indium:** 99.9%, $2.25 per troy ounce.

**Silver:** Open market, N. Y., 60.75c, per ounce.

**Platinum:** $53-$56 per ounce.

**Palladium:** $24 per troy ounce.

**Iridium:** $80-$90 per troy ounce.

## Rolled, Drawn, Extruded Products

(Copper and brass products prices based on 21.50c, Conn., for copper. Freight prepaid on 100 lb or more.)

**Sheet:** Copper 33.68c; yellow brass 29.63c; commercial bronze, 95% 33.72c, 90% 33.11c, red brass, 85% 31.99c, 80% 31.38c; best quality 30.64c; Everdur, Duronze, Herculoy or equiv., cold-drawn, 38.44c; nickel silver, 18%, 42.49c; phosphor bronze, grade A, 5%, 52.00c.

**Rods:** Copper, hot rolled 30.03c, cold drawn 31.03c; yellow brass, free cutting, 24.39c; commercial bronze, 95% 33.41c, 90% 32.80c; red brass, 85% 31.68c, 80% 31.07c; best quality 30.33c.

**Seamless Tubing:** Copper 33.72c; yellow brass 32.39c; commercial bronze 90% 35.52c; red brass 85% 34.65c, 80% 34.04c; best quality brass 33.05c.

**Wire:** Yellow brass 29.92c; commercial bronze, 95% 34.01c, 90% 33.40c; red brass, 85% 32.28c, 80% 31.67c; best quality brass 30.93c.

**Copper Wire:** Bare, soft, fob eastern mills, carlots 27.72c, less carlots 28.22c; weatherproof, fob eastern mills carlots 28.12c, less carlots 28.62c; magnet, delivered, carlots 29.75c-31.13c, 15,000 lb or more 30.00c-31.38c, less carlots 30.50c-31.88c.

**Aluminum Sheets and Circles:** 2s and 3s flats, mill finish, base 30,000 lb or more, fob shipping point. Actual transportation charges (not to exceed lowest carload rail freight rate) are deducted on orders for domestic delivery of 500 lb or more of one product to one destination. Widths from 12 in. and diameters from 9 in. to indicated maximum sizes. Prices, cents per lb, effective Jan. 30, 1947.

| B. & S. Gage | Max. Width or Diam. | Sheet Base | Circle Base |
|---|---|---|---|
| 0.0249"-7 | 48" | 23.70 | 26.20 |
| 8-10 | 48" | 24.20 | 26.70 |
| 11-12 | 26" | 24.70 | 27.50 |
| 13-14 | 26" | 24.90 | 27.90 |
| 15-16 | 26" | 25.10 | 28.20 |
| 17-18 | 26" | 25.40 | 28.60 |
| 19-20 | 24" | 25.70 | 29.00 |
| 21-22 | 24" | 26.10 | 29.50 |
| 23-24 | 24" | 26.60 | 30.20 |
| 25 | 24" | 27.10 | 30.90 |
| 26 | 24" | 27.80 | 31.90 |
| 27 | 24" | 28.50 | 33.00 |
| 28 | 24" | 29.20 | 33.70 |
| 29 | 24" | 30.00 | 34.70 |
| 30 | 24" | 30.80 | 35.80 |

**Lead Products:** Prices to jobbers: Sheets, full rolls, 140 sq ft or more, 18.25c; add per hundredweight, 25c, 80 to 140 sq ft; 50c, 20 to 80 sq. ft; 75c, 10 to 20 sq ft and circles.
Pipe: Full coils 17.50c; cut coils 17.75c.
Lead Traps and Bends: List plus 42%.

**Zinc Products:** Sheet, 15.50c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 14.50c, fob mill, 36,000 lb and over. Plates, not over 12-in., 13.50c; over 12-in., 14.50c.

## Plating Materials

**Chromic Acid:** 99.75%, flake, fob Philadelphia, carloads, 21.00c; 5 tons and over 21.50c; 1 to 5 tons, 22.00c; less than 1 ton, 22.50c.

**Copper Anodes:** Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 29.84c; oval, 29.34c; electro-deposited, 29.09c; cast, 28.84c.

**Copper Carbonate:** 52-54% metallic Cu, 50 lb bags, 26.50c.

**Copper Cyanide:** 70-71% Cu, 100-lb drums, 45.00c fob Cleveland.

**Sodium Cyanide:** 96-98%, ½-oz ball, in 100 or 200 lb drums, 1 to 400 lb, 16.00c, 500 lb and over, 15.00c, fob Cleveland; 1 cent less, fob Niagara Falls.

**Nickel Anodes:** Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c; 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; add 1 cent for rolled depolarized.

**Nickel Chloride:** 100-lb kegs, 22.00c; 275-lb bbls, 20.00c.

**Tin Anodes:** Bar, 1000 lb and over 92.50c; 500 to 1000 lb, 93.00c; 200 to 500 lb, 93.50c; less than 200 lb, 94.00c; ball, 1000 lb and over, 94.75c; 500 to 1000 lb, 95.25c; 200 to 500 lb. 95.75c; less than 200 lb, 96.25c, fob Sewaren, N. J.

**Tin Chloride:** Fob Grasselli, N. J., 625 lb bbls., 60.00c; 100 lb kegs, 60.50c.

**Sodium Stannate:** To all consumers: in 200 or 500 lb drums, 49.50c; 100 lb, 50.50c; 50 lb, 55.00c; 25 lb, 57.00c.
To consumers other than automobile, radio and refrigerator makers: 1500 lb, 45.85c; 600 to 1400 lb, 48.50c.
To automobile, radio and refrigerator makers: 10,000 lb and over, 44.50c; 2000 to 9999 lb 45.50c; 1000 to 1999, 46.50c; 600 to 9999 lb, 48.50c.

**Zinc Cyanide:** 100-lb drums 36.00c, fob Cleveland; 35.00c, fob Niagara Falls.

## Scrap Metals

### BRASS MILL ALLOWANCES

(Based on 21.50c, Conn., for copper)

Prices for less than 15,000 lb fob shipping point. Add ¾c for 15,000-40,000 lb; 1c for 40,000 or more.

| | Clean Heavy | Rod Ends | Clean Turnings |
|---|---|---|---|
| Copper | 19.125 | 19.125 | 18.375 |
| Yellow brass | 15.125 | 14.875 | 14.250 |
| Commercial Bronze | | | |
| 95% | 18.000 | 17.750 | 17.250 |
| 90% | 17.500 | 17.250 | 16.750 |
| Red brass | | | |
| 85% | 17.250 | 17.000 | 16.500 |
| 80% | 16.875 | 16.625 | 16.125 |
| Best Quality (71-79%) | 16.125 | 15.875 | 15.375 |
| Muntz Metal | 14.125 | 13.875 | 13.375 |
| Nickel silver, 5% | 16.125 | 15.875 | 8.063 |
| Phos. bronze, A. B. | 20.000 | 19.750 | 18.750 |
| Naval brass | 14.500 | 14.250 | 13.750 |
| Manganese bronze | 14.500 | 14.250 | 13.625 |

### BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 15.50, No. 2 copper 14.00, light copper 13.50, composition red brass 13.25, auto radiators 10.00, heavy yellow brass 9.00, brass pipe 9.00.

### REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 17.00; No. 2 copper, 15.50, light copper, 14.50; refinery brass (60% copper), per dry copper content less $5 smelting charge for brass analyzing 60 per cent or more, 13.62½.

### DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

**Copper and Brass:** Heavy copper and wire, No. 1 15.00-15.50, No. 2 13.75-14.00, light copper 12.50-13.00; No. 1 composition red brass 11.00-11.50, No. 1 composition turnings 10.00-10.50, mixed brass turnings 5.50-6.00, new brass clippings 12.00-12.50, No. 1 brass rod turnings 10.50-11.00, light brass 4.75-5.00, heavy yellow brass 6.50-7.00, new brass rod ends 11.00-11.50, auto radiators, unsweated 8.50-8.75, cocks and faucets 8.50-9.00, brass pipe 8.25-8.50.

**Lead:** Heavy lead 10.50-11.00, battery plates 6.00-6.25, linotype and stereotype 12.25-12.50, electrotype 10.75-11.00, mixed babbitt 11.00-11.50, solder joints 15.50-16.00.

**Zinc:** Old zinc 5.00-5.50, new die cast scrap 3.75-4.00, old die cast scrap 2.00-2.50.

**Tin:** No. 1 pewter 50.00-52.00, block tin pipe 67.00-68.00, auto babbitt 40.00-42.00, No. 1 babbitt 40.00-43.00, siphon tops 40.00-42.00.

**Aluminum:** Clippings, 2S, 8.00-8.50, old sheets 5.00-5.50, crankcase 4.00-4.50, borings and turnings 2.00, pistons, free of struts, 4.00-4.50.

**Nickel:** Anodes 18.50-19.00, turnings 15.50-16.50, rod ends 18.00-19.00.

**Monel:** Clippings 13.00-14.00, turnings 7.50-8.00, old sheet 11.00-12.00, rods 11.50-12.50, castings 9.00.

# OPEN MARKET PRICES, IRON AND STEEL SCRAP

**Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.**

### PITTSBURGH

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $34.50-35.00 |
| No. 2 Heavy Melt. Steel | 34.50-35.00 |
| No. 1 Busheling | 34.50-35.00 |
| Nos. 1, 2 & 3 Bundles | 34.50-35.00 |
| Machine Shop Turnings | 29.50-30.00 |
| Mixed Borings, Turnings | 29.50-30.00 |
| Short Shovel Turnings | 31.50-32.00 |
| Cast Iron Borings | 30.50-31.00 |
| Bar Crops and Plate | 39.00-40.00 |
| Low Phos. Cast Steel | 39.00-40.00 |
| Punchings & Plate Scrap | 39.00-40.00 |
| Cut Structurals | 39.00-40.00 |
| Elec. Furnace Bundles | 39.00-40.00 |
| Heavy Turnings | 31.00-31.50 |
| No. 1 Chemical Borings | 31.00-32.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola | 40.00-41.00 |
| Charging Box Cast | 35.00-35.50 |
| Heavy Breakable Cast | 34.00-34.50 |
| Stove Plate | 37.50-38.00 |
| Unstripped Motor Blocks | 37.50-38.00 |
| Malleable | 44.50-45.00 |
| Brake Shoes | 35.00-36.00 |
| Clean Auto Cast | 40.00-41.00 |
| No. 1 Wheels | 42.00-42.50 |
| Burnt Cast | 35.00-36.00 |

Railroad Scrap*

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 38.50-38.66 |
| R.R. Malleable | 44.50-45.00 |
| Axles | 40.00-41.00 |
| Rails, Rerolling | 37.00-37.50 |
| Rails, Random Lengths | 35.00-36.00 |
| Rails, 3 ft and under | 39.00-39.50 |
| Rails, 18 in. and under | 41.00-41.50 |
| Railroad Specialties | 43.00-43.50 |
| Uncut Tires | 38.00-39.00 |
| Angles, Splice Bars | 38.00-38.50 |

* Brokers buying prices.

### CLEVELAND

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $33.50-34.00 |
| No. 2 Heavy Melt. Steel | 33.50-34.00 |
| No. 1 Busheling | 33.50-34.00 |
| Nos. 1 & 2 Bundles | 33.50-34.00 |
| Machine Shop Turnings | 28.00-29.00 |
| Mixed Borings, Turnings | 29.00-30.00 |
| Short Shovel Turnings | 29.00-30.00 |
| Cast Iron Borings | 28.00-29.00 |
| Bar Crops and Plate | 35.50-37.00 |
| Cast Steel | 35.50-37.00 |
| Punchings & Plate Scrap | 35.50-37.00 |
| Elec. Furnace Bundles | 33.50-35.00 |
| Heavy Turnings | 32.00-33.50 |
| Alloy Free Turnings | 29.50-30.00 |
| Cut Structurals | 37.50-38.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola | 44.50-45.50 |
| Charging Box Cast | 38.00-40.00 |
| Stove Plate | 38.00-40.00 |
| Heavy Breakable Cast | 38.00-40.00 |
| Unstripped Motor Blocks | 41.00-42.00 |
| Malleable | 52.00-55.00 |
| Brake Shoes | 42.00 |
| Clean Auto Cast | 45.00 |
| No. 1 Wheels | 42.00 |
| Burnt Cast | 38.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 35.00-37.00 |
| R.R. Malleable | 52.00-55.00 |
| Rails, Rerolling | 40.00-41.00 |
| Rails, Random Lengths | 41.00-43.00 |
| Rails, 3 ft and under | 45.00 |
| Railroad Specialties | 44.00 |
| Uncut Tires | 42.00 |
| Angles, Splice Bars | 45.00 |

### VALLEY

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $35.00 |
| No. 2 Heavy Melt. Steel | 35.00 |
| No. 1 Bundles | 35.00 |
| Machine Shop Turnings | 27.00 |
| Short Shovel Turnings | 28.00-30.00 |
| Cast Iron Borings | 28.50-30.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 35.00-37.00 |

### MANSFIELD

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $33.00-34.50 |
| Machine Shop Turnings | 27.00 |
| Short Shovel Turnings | 29.00 |

### CINCINNATI

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $31.00 |
| No. 2 Heavy Melt. Steel | 31.00 |
| No. 1 Busheling | 31.00 |
| No. 1 Bundles | 31.00 |
| No. 2 Bundles | 31.00 |
| Machine Shop Turnings | 25.00 |
| Mixed Borings, Turnings | 24.00 |
| Short Shovel Turnings | 27.00 |
| Cast Iron Borings | 26.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 42.00 |
| Charging Box Cast | 34.00 |
| Heavy Breakable Cast | 35.00 |
| Stove Plate | 32.00 |
| Unstripped Motor Blocks | 34.00 |
| Brake Shoes | 31.00 |
| Clean Auto Cast | 40.00 |
| Drop Broken Cast | 44.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt | 35.00 |
| R.R. Malleable | 48.00 |
| Rails, Rerolling | 39.00 |
| Rails, Random Lengths | 39.00 |
| Rails, 18 in. and under | 44.00 |

### DETROIT

(Dealers buying prices, fob shipping point)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $27.50-28.00 |
| No. 1 Busheling | 27.50-28.00 |
| Nos. 1 & 2 Bundles | 27.50-28.00 |
| No. 3 Bundles | 27.50-28.00 |
| Machine Shop Turnings | 22.50-23.00 |
| Mixed Borings, Turnings | 22.50-23.00 |
| Short Shovel Turnings | 23.50-24.00 |
| Cast Iron Borings | 23.50-24.00 |
| Punchings & Plate Scrap | 32.00-32.50 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 33.00-34.00 |
| Heavy Breakable Cast | 25.00-27.00 |
| Clean Auto Cast | 33.00-34.00 |

### BUFFALO

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $33.00-34.00 |
| No. 2 Heavy Melt. Steel | 33.00-34.00 |
| No. 1 Busheling | 33.00-34.00 |
| Nos. 1 & 2 Bundles | 33.00-34.00 |
| Machine Shop Turnings | 23.50-24.00 |
| Mixed Borings, Turnings | 23.50-24.00 |
| Cast Iron Borings | 23.50-24.00 |
| Short Shovel Turnings | 24.00-25.00 |
| Punchings & Plate Scrap | 35.00-36.00 |
| Elec. Furnace Bundles | 37.00-38.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 35.00-38.00 |
| Heavy Breakable Cast | 33.00-34.00 |
| Malleable | 38.00-39.00 |
| No. 1 Wheels | 35.00-36.00 |

### PHILADELPHIA

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $36.50-37.00 |
| No. 2 Heavy Melt. Steel | 36.50-37.00 |
| No. 1 Busheling | 36.50-37.00 |
| No. 1 Bundles | 36.50-37.00 |
| No. 2 Bundles | 36.50-37.00 |
| No. 3 Bundles | 33.50-34.00 |
| Machine Shop Turnings | 28.00-28.50 |
| Mixed Borings, Turnings | 26.00-26.50 |
| Short Shovel Turnings | 28.00-28.50 |
| Bar Crops and Plate | 38.00-39.00 |
| Punchings & Plate Scrap | 38.00-39.00 |
| Cut Structurals | 37.50-38.00 |
| Elec. Furnace Bundles | 36.50-37.50 |
| Heavy Turnings | 35.00-36.00 |
| No. 1 Chemical Borings | 32.00-33.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 46.00-47.00 |
| Charging Box Cast | 45.00-46.00 |
| Heavy Breakable Cast | 45.00-46.00 |
| Unstripped Motor Blocks | 42.00-43.00 |
| Malleable | 52.00-53.00 |
| Clean Auto Cast | 45.00-46.00 |
| No. 1 Wheels | 45.00-46.00 |

### NEW YORK

(Dealers buying prics, fob shipping point)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $32.00 |
| No. 2 Heavy Melt. Steel | 32.00 |
| No. 1 Busheling | 32.00 |
| Nos. 1 & 2 Bundles | 32.00 |
| No. 3 Bundles | 30.00 |
| Machine Shop Turnings | 21.50-22.00 |
| Mixed Borings, Turnings | 21.50-22.00 |
| Short Shovel Turnings | 23.50-24.00 |
| Punchings & Plate Scrap | 32.00-32.50 |
| Cut Structurals | 32.00-32.50 |
| Elec. Furnace Bundles | 32.00 |
| No. 1 Chemical Borings | 24.50-25.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 41.50-42.00 |
| Charging Box Cast | 41.50-42.00 |
| Heavy Breakable | 41.50-42.00 |
| Unstripped Motor Blocks | 35.00-36.00 |
| Malleable | 46.00-48.00 |

### BOSTON

(Fob shipping point)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $30.00-31.00 |
| No. 2 Heavy Melt. Steel | 30.00-31.00 |
| Nos. 1 & 2 Bundles | 30.00-31.00 |
| No. 1 Busheling | 30.00-31.00 |
| Machine Shop Turnings | 23.00-24.00 |
| Mixed Borings, Turnings | 21.50-22.00 |
| Short Shovel Turnings | 26.00-27.00 |
| Bar Crops and Plate | 32.00-33.00 |
| Punchings & Plate Scrap | 32.00-33.00 |
| Chemical Borings | 24.00-25.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 40.00-42.00 |
| Charging Box Cast | 38.00 |
| Heavy Breakable Cast | 36.00-37.00 |
| Stove Plate | 31.00-32.00 |
| Unstripped Motor Blocks | 30.00 |
| Clean Auto Cast | 40.00 |

### CHICAGO

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $33.50-34.00 |
| No. 2 Heavy Melt. Steel | 33.50-34.00 |
| Nos. 1 & 2 Bundles | 33.50-34.00 |
| No. 3 Bundles | 30.50-31.00 |
| Machine Shop Turnings | 28.50-29.00 |
| Mixed Borings, Turnings | 28.50-29.00 |
| Short Shovel Turnings | 28.50-29.00 |
| Cast Iron Borings | 28.50-29.00 |
| Bar Crops and Plate | 35.50-36.00 |
| Cast Steel | 34.50-35.00 |
| Punchings | 35.50-36.00 |
| Elec. Furnace Bundles | 33.50-34.00 |
| Heavy Turnings | 30.50-31.00 |
| Cut Structurals | 35.50-36.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 37.00-41.00 |
| Malleable | 38.00-41.00 |
| Clean Auto Cast | 37.00-41.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 34.50-35.00 |
| Rails, Rerolling | 40.00-41.00 |
| Rails, Random Lengths | 35.50-36.50 |
| Rails, 3 ft. and under | 40.00-41.00 |
| Rails, 18 in. and under | 42.00-43.00 |
| Railroad Specialties | 39.00-40.00 |
| Angles, Splice Bars | 39.00-40.00 |

### ST. LOUIS

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $32.50-33.50 |
| No. 2 Heavy Melt. Steel | 30.00-31.00 |
| Machine Shop Turnings | 24.00-26.00 |
| Short Shovel Turnings | 27.00-28.00 |

Cast Iron Grades
(Fob shipping point)

| | |
|---|---|
| No. 1 Cupola Cast | 38.00-40.00 |
| Charging Box Cast | 32.00-34.00 |
| Heavy Breakable Cast | 30.00-31.00 |
| Stove Plate | 29.00-32.00 |
| Brake Shoes | 36.00-38.00 |
| Clean Auto Cast | 39.00-40.00 |
| No. 1 Wheels | 38.00-40.00 |
| Burnt Cast | 29.00-32.00 |

Railroad Scrap

| | |
|---|---|
| R.R. Malleable | 50.00-52.00 |
| Rails, Rerolling | 37.50-40.00 |
| Rails, Random Lengths | 35.00-37.00 |
| Rails, 3 ft and under | 40.00-42.00 |
| Uncut Tires | 34.50-35.50 |
| Angles, Splice Bars | 36.00-38.00 |

### BIRMINGHAM

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $31.00 |
| No. 2 Heavy Melt. Steel | 31.00 |
| No. 1 Busheling | 31.00 |
| Nos. 1 & 2 Bundles | 31.00 |
| No. 3 Bundles | 25.00 |
| Long Turnings | 22.00 |
| Short Shovel Turnings | 24.00 |
| Cast Iron Borings | 23.00 |
| Bar Crops and Plate | 32.00-33.00 |
| Punchings & Plate Scrap | 36.00-37.00 |
| Cut Structurals | 36.00-37.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 38.00-39.00 |
| Stove Plate | 34.00-35.00 |
| No. 1 Wheels | 32.00-32.50 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 32.00 |
| R.R. Malleable | 37.50-38.00 |
| Axles, Steel | 33.00 |
| Rails, Rerolling | 36.00-37.00 |
| Rails, Random Length | 30.00-31.00 |
| Rails, 3 ft and under | 32.00-33.00 |
| Angles and Splice Bars | 32.00-33.00 |

### SAN FRANCISCO

| | |
|---|---|
| No. 1 Heavy Melt. Steel | *$19.04 |
| No. 2 Heavy Melt. Steel | *19.04 |
| No. 1 Busheling | *19.04 |
| Nos. 1 & 2 Bundles | *19.04 |
| No. 3 Bundles | *17.04 |
| Machine Shop Turnings | *12.54 |
| Bar Crops and Plate | 18.00 |
| Cast Steel | 18.00 |
| Alloy Free Turnings | 8.00 |
| Cut Structurals | 20.00-20.50 |
| Tin Can Bundles | 17.00 |

Railroad Scrap

| | |
|---|---|
| Axles | 26.50 |
| Rails, Random Lengths | 21.00 |
| Uncut Tires | 28.00 |

*Fob California shipping point.

### SEATTLE

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $20.00 |
| No. 2 Heavy Melt. Steel | 20.00 |
| No. 1 Busheling | 20.00 |
| Nos. 1 & 2 Bundles | 20.00 |
| No. 3 Bundles | 18.00 |
| Machine Shop Turnings | 11.50 |
| Mixed Borings, Turnings | 11.50 |
| Punchings & Plate Scrap | 21.50 |
| Cut Structurals | 21.50 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 27.50 |
| Charging Box Cast | 22.50 |
| Heavy Breakable Cast | 21.50 |
| Stove Plate | 23.00 |
| Unstripped Motor Blocks | 21.50 |
| Malleable | 27.50 |
| Brake Shoes | 27.50 |
| Clean Auto Cast | 27.50 |
| No. 1 Wheels | 24.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 20.00 |
| Railroad Malleable | 27.50 |
| Rails, Random Lengths | 20.00 |
| Angles and Splice Bars | 21.50 |

### LOS ANGELES

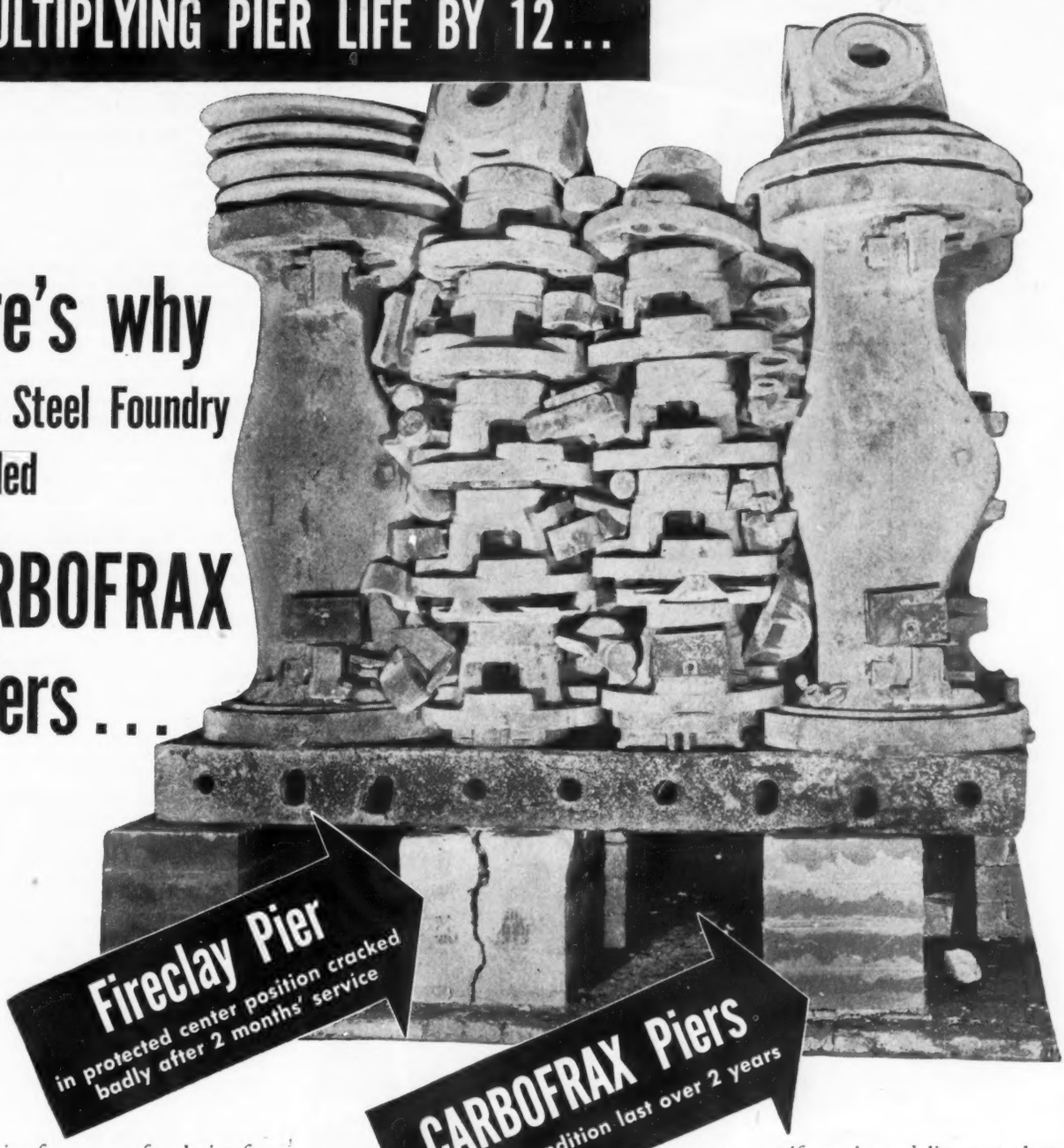
| | |
|---|---|
| No. 1 Heavy Melt. Steel | $19.50 |
| No. 2 Heavy Melt. Steel | 19.50 |
| Nos. 1 & 2 Bundles | 19.50 |
| Machine Shop Turnings | 14.50 |
| Mixed Borings, Turnings | 14.50 |
| Punchings & Plate Scrap | 27.50 |
| Elec. Furnace Bundles | 27.50 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 30.00 |

# MULTIPLYING PIER LIFE BY 12...

## Here's why Large Steel Foundry installed CARBOFRAX Piers...


Fireclay Pier
in protected center position cracked badly after 2 months' service
CARBOFRAX Piers
in perfect condition last over 2 years

The annoying frequency of replacing fireclay piers on normalizing cars resulted in high costs at this plant. With five tons of steel castings per alloy grid (4 grids per car) at temperatures to 1750°F, pier life rarely exceeded two months.

As a corrective measure, CARBOFRAX silicon carbide piers were first installed at grid corners. Here, they outlasted more protected fireclay piers by upwards of 22 months. Proved through comparison of performance, CARBOFRAX piers are now used exclusively. Their endurance is attributed to high thermal shock resistance and exceptional load bearing strength at high temperatures. They do not spall or crack easily. They withstand the abuse of crane loading. Their high thermal conductivity assures more uniform heat delivery to lower load sections.

CARBOFRAX pier performance slashes pier costs, cuts labor expense and eliminates repeated replacements for this operator. This experience may be duplicated in your operations. Write Dept. J-67 for facts. The Carborundum Company, Refractories Division, Perth Amboy, New Jersey.

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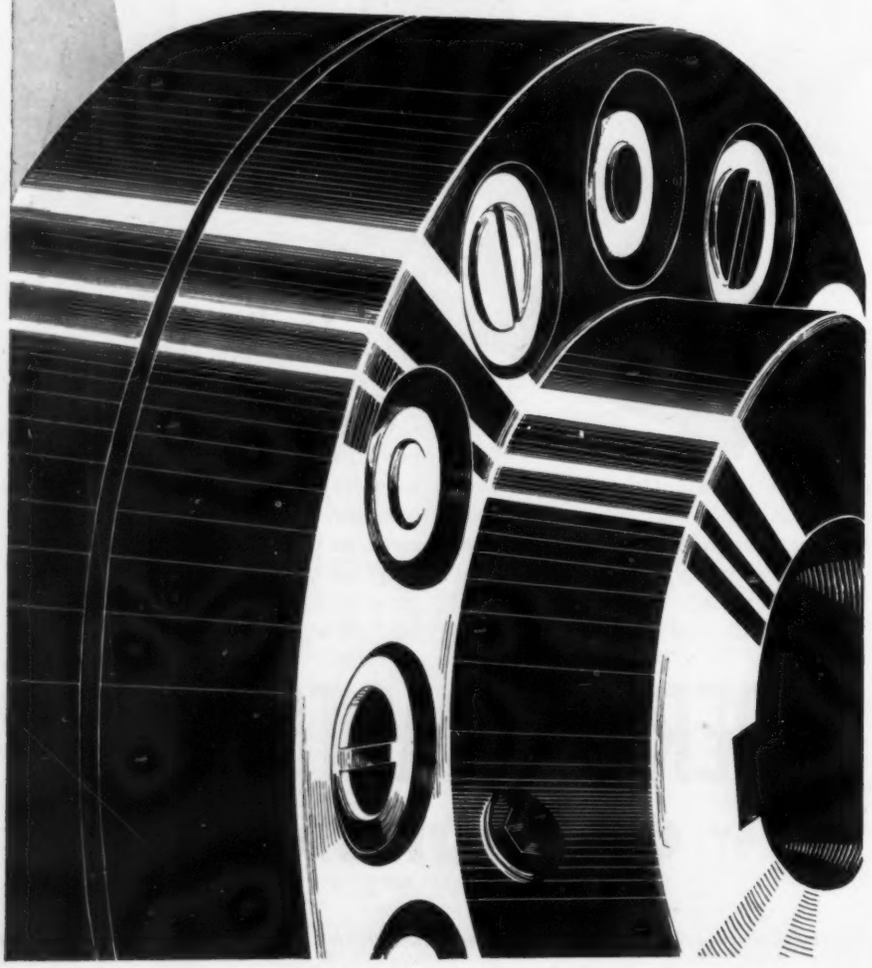


## Sheets, Strip. . .

*Consumers still press for deliveries despite vacation plant closings*

Sheet Prices, Page 114

**Boston**—Steel buyers are more realistic in estimating requirements, which are high for flat-rolled products. With the exception of a minor volume of heavier gage hot-rolled products, consumers are taking all tonnage allocated for the third quarter. Supplies of cold-rolled, hot-rolled pickled and galvanized are below needs. Electrical and enameling sheets are also short and some substitution of cold-rolled is being done for the latter grade. For both, demand is nearly double that of prewar years. A slight improvement is apparent in the supply of hot-rolled strip for cold reduction. While no bids were received for the bulk of tonnage recently offered by the Springfield, Mass., armory, one section of the inquiry was awarded to Wallingford Steel Co., Wallingford, Conn.

**New York** — Demand for stainless steel sheets continues to drag and some of the jobbing polishers have reduced prices for their services. In some cases this amounts to a cut of about 25 per cent of the polishing differential quoted by the mills.

Sheet demand otherwise continues strong, and while there are some scattered cancellations, there are other consumers eager to obtain the tonnage canceled.

**Philadelphia** — Stringency in sheets, except stainless, continues. Various consumer plants are closing down for vacations, but in most instances they want all steel ordered, even though they have requested suspension of shipments during the vacation period. Most mills are protecting them, or are planning to if their schedules are not badly disrupted by a nation-wide coal strike.

**Chicago**—Mills report that, despite reports of unbalanced inventories and vacation shutdowns in metal consuming plants, quotas of sheets and strip are being specified against and taken in full. In many cases, larger quotas are asked for. In this area, at least, there have been no requests for delay in shipments or cancellations. Some refrigerator manufacturers are operating at only 30 to 40 per cent of capacity because of inability to obtain adequate supply of flat rolled products.

**Cincinnati**—District sheet and strip mills have reduced carryover by uninterrupted high production during the second quarter. However, this was anticipated in the making of third quarter schedules so that there is little chance for free tonnage to supplement previously announced allotments. Demand continues to run well ahead of supply.

**Birmingham** — Demand for sheets far exceeds supply. Processors who had no regularly established source of supply are finding it difficult to keep plants open. Southern sheet producers hold that old established customers must be taken care of, regardless of location. Some measure of relief is in sight, but that will not be adequate, at least until well into the future.

**St. Louis**—Sheet production continues to pick up, with capacity operations expected in July. Demand shows no sign of abating. On the contrary, mills are

under constantly increasing pressure to make deliveries and accept new orders. Executives say the middle west is producing a totally unexpected sheet demand, which, added to calls from some eastern points, indicates capacity operation for two years or more. Granite City Steel Co.'s new cold rolling mill now appears likely to be operating in late September, construction work picking up by reason of better labor conditions. Eighty-five percent of the firm's tonnage is now on sheets, the remainder plates. The company last week made a number of minor adjustments in extra cards, for the most part downward and representing a correction of inequities created in the last industry-wide price increase.

## Steel Bars. . .

*Cold-drawn supply improves with some producers seeking orders in more sizes*

Bar Prices, Page 114

**New York** — With various consuming plants suspending operations for vacations, for one to two weeks in most cases, pressure for hot carbon bars is the lightest in some time. Some of the plants now closing down for vacations are arranging to take in scheduled shipments, but there are a number which are not, especially where they have been able to obtain assurances from their suppliers that their requirements will be taken care of as soon as they resume work and, in fact, have been advised they would not lose out on any of their scheduled tonnage.

Principal demand is for the small sizes and in general producers are tightly sold up for the entire third quarter on these specifications. In the medium and large sizes the situation is generally easy with a further betterment in supply anticipated as the summer advances. Cold drawn bars continue in definitely easier supply, this applying to some extent to even the small sizes. Alloy bars, both hot and cold, can be had with little difficulty within a month to six weeks.

**Boston** — Cold-drawn bar schedules have eased to the extent most producers are soliciting business on more sizes for nearby delivery. Volume of new business is light since most consumers and warehouses are well inventoried and are covered for the third quarter. Hot-rolled carbon bars in small sizes are short of requirements but there is some improvement in lower ranges of sizes. Flat and all bar shape angles, channels and tees are in heavy demand.

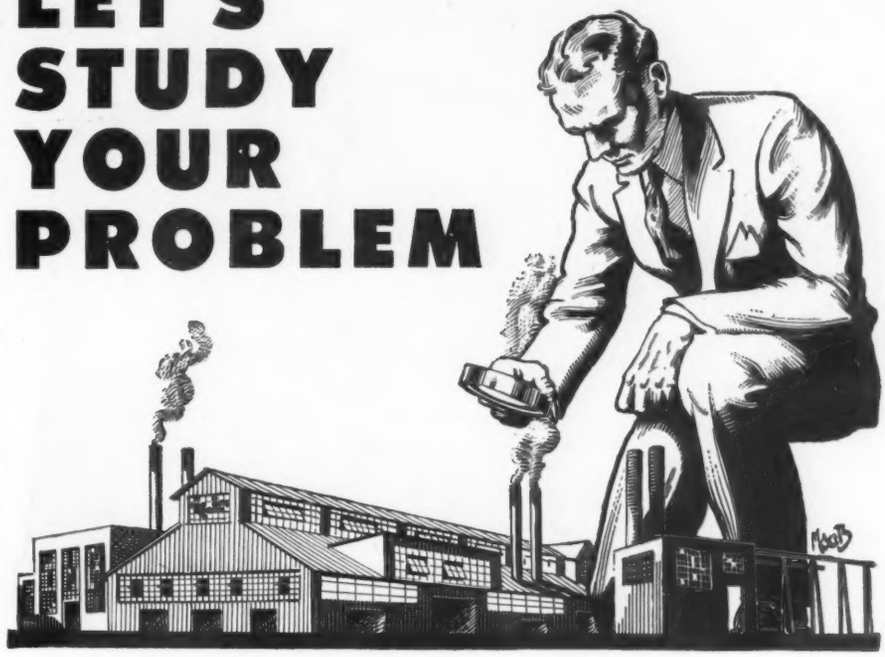
**Philadelphia** — Except in the small sizes, carbon bar supply continues to ease, and this is more pronounced in the cold-drawn grades than in the hot-rolled. Alloy bar supply remains easy, with deliveries available in four to five weeks on the hot-rolled grades.

## Tubular Goods. . .

Tubular Goods Prices, Page 115

**Buffalo** — Lifting of government restrictions on the making of larger sizes of pipe will boost production at the Buffalo Pipe & Foundry Corp., Tonawanda, N. Y., to a new peak, President Cameron Baird has announced. The company is now operating at its best level


LET'S STUDY YOUR PROBLEM



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Is it Increased Capacity?

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Engineers and Architects

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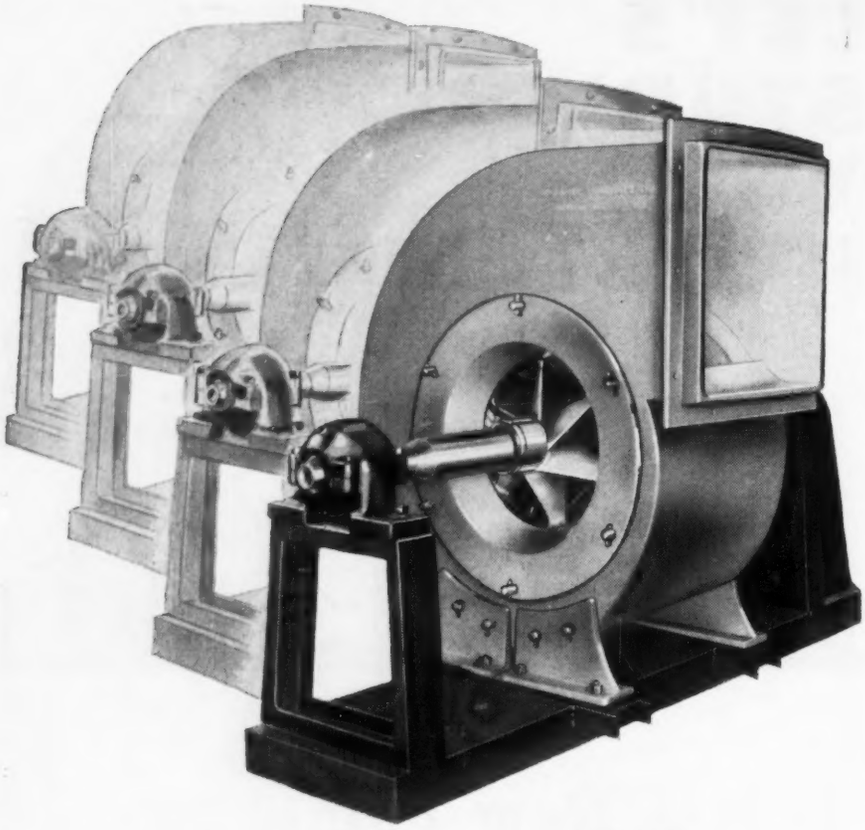

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Where gases may contain abrasive dust—but temperatures are not excessive—abrasion-resistant alloys are available. Where resistance to corrosion is required, Michiana stainless steel castings may be employed. Thus the service indicates the alloy materials to be used.

MICHIANA Fans will help you improve output and uniformity of product. Their long life makes them economical . . . Our engineers are ready to make practical recommendations . . .
MICHIANA PRODUCTS CORPORATION, Michigan City, Indiana.

**MICHIANA**
**HIGH TEMPERATURE, RECIRCULATING FANS**

*Write for Bulletin 645*


on record, turning out cast iron pipe from four to 15 inches in diameter.

**Seattle** — Inquiry for cast iron pipe continues active but in view of deferred deliveries many sizable projects are being delayed. One agency is quoting 12 to 14 months delivery; another, 24 months. Inventories have disappeared as stocks have been cleared by recent demands.

## Steel Plate. . .

*Claymont, Del., producer increases prices $2, due to higher raw material costs*

Plate Prices, Page 115

**Philadelphia** — The Claymont, Del., producer has increased price of plates $2 a ton to the basis of 2.90c per pound, fob mill, due primarily to higher raw material costs. No change has been announced by other district plate producers.

Plate inquiry has eased somewhat, due in part to seasonal influences. However, producers are still unable to make material reductions in order backlogs and all could enter much more tonnage if they cared to increase their schedules. Some major sellers are still refusing to accept specifications for shipment beyond the third quarter and, hence, are virtually out of the market. Others are entering such tonnage for delivery late in the year, but on a highly selective basis.

**New York** — Labor disruptions in the district ship yards coupled with suspension of operations at various plate shops for vacations, have reduced pressure for plates. However, sellers generally are still well behind on their commitments and there appears to be little prospect of any material easing in demand for some time to come. Some eastern mills are going into the third quarter with shipment arrearages ranging from one to three months and in all cases mills appear to be booked up solidly for the third quarter. Those which are booking on a quarterly basis consequently are out of the market entirely at present. Others are still taking some tonnage for fourth quarter on a highly selective basis.

**Boston** — Producers are making but slight progress toward reducing order backlogs, although new buying has slackened. Heavy sizes are in larger supply. Weldment shops, with substantial backlogs, generally have balanced inventories. With the possible exception of tank shops taking light plates, demand has eased slightly with a tendency among buyers to order closer to known requirements. In a few instances, fabricators are specifying slightly below third quarter allotments, but warehouses are clamoring for additional tonnage.

**Birmingham** — Overall situation in plates is strong, although much of the pressure for delivery has eased. Mills view this development, however, as a temporary condition. Shipbuilding is still active on the Gulf Coast and car production at Bessemer is being stepped up. Result is that sustained demand for plates is assured.

**Seattle** — Plate supplies have eased slightly but deliveries are well below present requirements. This condition compels shops to confine new business

to small tonnages. Operations are geared to supplies. Inventories are extremely low. Unstated tonnages are involved in awards for several large tanks for Monsanto Chemical Co.'s new Seattle plant, of which 200 tons have been placed with Hydraulic Supply Co., Seattle.

## Wire . . .

Wire Prices, Page 115

**Pittsburgh** — Most merchant wire items remain in critical short supply, with jobbers unable to meet customers' requirements. In most instances jobbers' inventories are unbalanced and well below normal levels. The expected easing in nail supply position has not developed, despite current monthly output of over 70,000 tons. No change is noted in wire rope demand from the somewhat depressed volume of recent months. Very heavy demand persists for all types of drawn and spring wire items; cold-heading wire is particularly scarce for fastener trade. Shortage of wire rods continues to restrict output of nonintegrated wire producers. Finishing operations at American Steel & Wire Co.'s Donora and Rankin plants were shut down for a one-week vacation period starting June 28; operations at company's other plants will be down for a two-week period.

**Boston**—Improvement in rod supply is spotty, emanating largely from one eastern mill, but the overall situation in semifinished with most nonintegrated producers is still critical. New buying of drawn wire is less active, although pressure for numerous high-carbon products is strong. The buying trend in wire is uneven because it enters into the production of so many end products. Production is falling off sharply due to vacations and no inroads on the overall backlogs is expected until late third quarter.

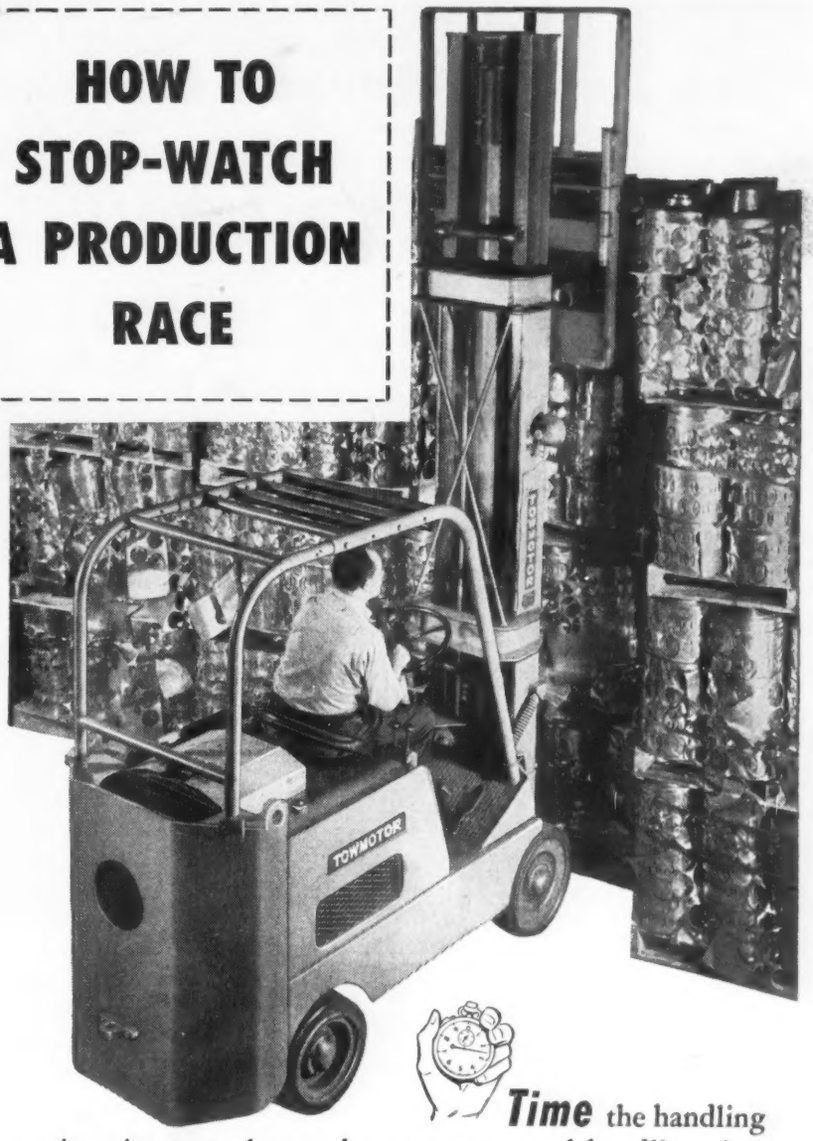
## Tin Plate. . .

Tin Plate Prices, Page 115

**Pittsburgh** — Although official action was not taken by mid-week, the Department of Commerce is expected to continue present conservation controls governing the end-use consumption of tin involving coating thickness regulations. The department likely will retain control over tin plate export shipments through issuance of quarterly allocation directives. Such action has been passed by the House and Senate with some minor revisions and is expected to be signed by President Truman prior to June 30. Government officials contend reserve tin stocks would be depleted before the yearend, perhaps by close of the third quarter, if tin coating restrictions were dropped.

Tin plate output remains well below customers' requirements, despite indicated easing in demand for the perishable food pack program and slight let-up in consumption for dog food and paint containers. A mild spurt in tin plate demand is expected to develop out of reported decision on West Coast to pack 44,000 tons of fruit instead of to sell fresh fruit as originally planned. Another report is to the effect that canners are urging that surplus supplies be shipped abroad to help ease foreign food shortage. This would be one way to reduce last season's large carryover packs. Fact


HOW TO STOP-WATCH A PRODUCTION RACE




*Time* the handling operations in your plant—then compare total handling time with total production time. If handling methods are obsolete, you'll find that handling is wasting much of the time saved by modern production machinery.

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OF ST. LOUIS, MISSOURI
• Won a New Contract!"

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Problem: To move and to re-erect seven surplus storage tanks from a closed U.S. Arsenal to a new location. These 21 foot high, 24 foot diameter tanks had to be moved with a minimum of dismantling and without distortion.

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that canned vegetables require too much shipping space for the food value they contain is said to be a major objection of government officials to this suggestion. Very heavy tin plate demand continues for oil and beer containers.

**Chicago** — Consumers of tin plate, principally manufacturers of containers, report their inventories as below normal. This in itself makes a certainty that balance between supply and demand cannot come this year, notwithstanding the fact that crop failures will result in smaller overall requirements for food containers than had been forecast. Producers of tin plate are operating their facilities up to the maximum possible consistent with shortage of black plate, tin and labor. Although box cars are scarce, the railroads have supplied enough to keep plate from piling up at mills.

## Structural Shapes. . .

**Structural Shape Prices, Page 115**

**Pittsburgh**—Steadily rising construction costs continue to force shelving of many building programs, particularly municipal work. A number of these projects have been permanently dropped, although bulk of the programs are said to be only temporarily deferred. Three applications by local steel companies for new construction permits, having total valuation of $1 million, were approved recently by the Office of the Housing Expediter. Jones & Laughlin Steel Corp. will spend $579,143 at the Pittsburgh Works; Columbia Steel & Shafting Co., $276,650 at the Carnegie plant; and Carnegie-Illinois Steel Corp., $220,000 at the Irvin Works. Number of construction projects approved by housing expediter's office registered a substantial increase last week, in contrast to recent downward trend.

**New York** — Structural bookings in May of 107,470 tons were the lightest since January, when 104,793 tons were placed. The May figure compared with the revised total for April of 146,568 tons, according to the American Institute of Steel Construction.

Estimated total tonnage for the first five months of 634,529 represented an increase of 12 per cent over the average of 565,436 tons booked in the same months in the averaged five pre-war years, 1936-1940.

May shipments of 136,443 tons compared with the revised April figure of 140,796 tons and brought the total for the first five months up to 691,814 tons, or 27 per cent greater than the averaged shipments in the same five months in the five pre-war years. Tonnage available for fabrication in the next four months on May 31 was 628,301 tons, against 337,237 tons available for fabrication in the averaged corresponding period before the war.

Several fair sized tonnages have been placed, including a 100-ton plant expansion at Nutley, N. J. Inquiry is picking up somewhat, although the projects in general are small and considerable work is still being shelved, pending more stabilized conditions. Outstanding is a section of municipal elevated highway in downtown Manhattan involving 2900 tons, on which project the Lynn Construction Co., general contractor, is low.

**Philadelphia** — Inquiry for structural steel is accumulating, although it still is not too active. Outstanding among pending work are 2700 tons, state bridge,

Luzerne county, Pennsylvania, on which Bethlehem Steel Co., Bethlehem, Pa., is low; 2500 tons, section Market St. subway, this city, on which bids are to be opened June 30. This latter project will also require 375 tons of reinforcing bars.

During the period June 13-19, the government approved in this district 75 nonhousing projects, valued at $1,479,573, and denied 21 projects, valued at $259,654.

**Chicago** — Activity in structural steel continues on a declining scale, obviously the result of the twin difficulties of short supply of steel and construction costs which are too high. Private and industrial work is declining, the reason being that prospective builders become discouraged. On the other hand, public works hold in substantial volume. Fabricators have enough business on their books to carry them through most of the balance of the year, some for an even longer period. Because of this, jobs which they wish to bid are selected carefully.

**Birmingham** — Not many structural awards have been reported over the past few days. Most of them are for relatively small tonnage of lighter shapes. Several major jobs are in prospect, however, and it is expected a renewal of shape demand will be in order with the advent of fall, at the latest.

**Seattle** — Fabricators are receiving shipments by water and rail but supplies continued inadequate for current needs. Rush orders are coming by rail shipment. Local plants are operating in proportion to the amount of steel rail available and are confining their new business largely to small tonnages. There is a strong demand for I-beams which are not available in sufficient tonnage.

## Refractories. . .

Refractories Prices, Page 116

**Cleveland** — Refractory interests report order backlogs are larger now than at any previous time including the war years when much new construction was undertaken. Efforts are being successfully made to take care promptly of all maintenance and repair work on coke ovens, blast furnaces and open hearths, but delivery dates on refractories for new facilities are extended into as late as third quarter, 1948. Super-duty, high-alumina and super-duty silica brick are quoted variously for delivery from 6 to 8 months up to third quarter next year. However, fairly prompt shipment can be obtained on some refractory products, dead-burned magnesite, for example. Silica standard shapes require about 8-10 weeks, although prompt delivery—2-3 weeks—is obtainable on small quantities of first quality fire clay brick and a few insulating materials. Basic material had been in relatively good supply, but until last week one of three leading producers was struck, the other two taking care of the third's customers as best they could. Metal-cased brick is short because of difficulty in obtaining steel casings for the product. Shortage of refractory materials, in addition to other construction requirements, has been a limiting factor in projected new facilities to alleviate the coke shortage. Prices quoted on refractory material by some producers are firm through third quarter of this year.

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## Pig Iron. . .

*Extension of bonus plan precludes any general price rise on foundry iron*

Pig Iron Prices, Page 116

**Philadelphia** — Last minute decision by Washington to extend the bonus incentive plan on foundry iron production for another six months appears to have precluded any general advance on foundry iron for the present, although an early advance in basic appears likely, possibly as much as $2 a ton. The upward trend in coke prices is a factor in the pig iron price situation. Beehive foundry coke has been advanced $2 a ton in some quarters and by-product foundry grades may be increased soon, possibly by July 1 in some instances. Demand continues particularly strong, and by-product coke producers are disposed to equalize with beehive producers. One leading district by-product producer, already undergoing extensive repairs, plans still heavier repairs in July with a further drop in shipments. However, should a full-fledged coal strike develop, the effects of this further drop will be minimized.

Extension of the allocation program on foundry iron for the housing program for another six months came as a surprise to many in the trade and caused some producers to revise quotas for July. Allocations for that month for housing work, which means primarily allocations for pipe foundries, are said to be on the same basis as for June.

**Pittsburgh** — Producers of electric furnace ferrosilicon have reduced prices $2 per ton, making the Niagara Falls base price $65 per gross ton. This product has been fluctuating considerably in recent months, having been tied closely to that of scrap. With the scrap market up sharply in recent weeks, an upturn in price of electric furnace ferrosilicon may develop next month. The price spread between high silicon silvery iron and electric furnace ferrosilicon is considerably greater than normal, due to wildly fluctuating scrap market.

Sellers of other grades of pig iron do not anticipate any price revision in near future, although it is acknowledged rising production costs may make such a move necessary later on. This reasoning however does not cover all producers, for it is pointed out some of the high cost stacks may be forced to take action, particularly in view of discontinuance of premium payments on tonnage going into federal housing program.

Pig iron operations were well sustained last week in spite of walk-out in many soft coal mines prior to miners' vacation period scheduled to start June 28. However some curtailment in blast furnace activity is indicated early this week at integrated steel plants. Toward close of last week there were 41 out of 47 furnaces pouring iron. Lone merchant iron producer here has over a month's supply of coal for its by-product coke operations. To offset sharp drop in bituminous coal shipments, this interest will be forced to discontinue some of its by-product coke sales in the open market. In addition to its own coke requirements, the merchant iron producer also is supplying needs of the Struthers furnace.

**Keokuk, Iowa**—Keokuk Electro-Metals Co. is now quoting electric furnace silvery pig iron at $64 a gross ton, fob Keokuk, for silicon content 14.01 to 14.5 per cent with an additional $1 per each additional half unit of silicon. Prices quoted fob Jackson, O., are $61.75 for the same grade.

**Boston** — Many melters are at a critical point as to pig iron-scrap mixtures; some being down to 15 to 20 per cent in iron and any early improvement in supply will be absorbed by an increase in the iron ratio. This improvement is not in sight with Buffalo and outside volume restricted. Many New England consumers would have experienced a sharp increase in costs next month, an advance of $775 a car for Evevrett iron had the subsidy plan not been extended. Base price for No. 2 foundry is $1475 under the subsidy arrangement and the new billing would have been $2250. Eventually, when supply of outside iron is available, the price factor will loom as important.

**New York** — With various foundries closing down for at least a week for vacations, the pig iron melt in this district in July will be down from the June rate. Should the soft coal miners continue to stay out beyond the end of their holiday period, pig iron producers would start reducing melt almost immediately. Many miners left the mines last week, protesting the passage of the Taft-Hartley bill, and, of course, thus reducing coal inventories.


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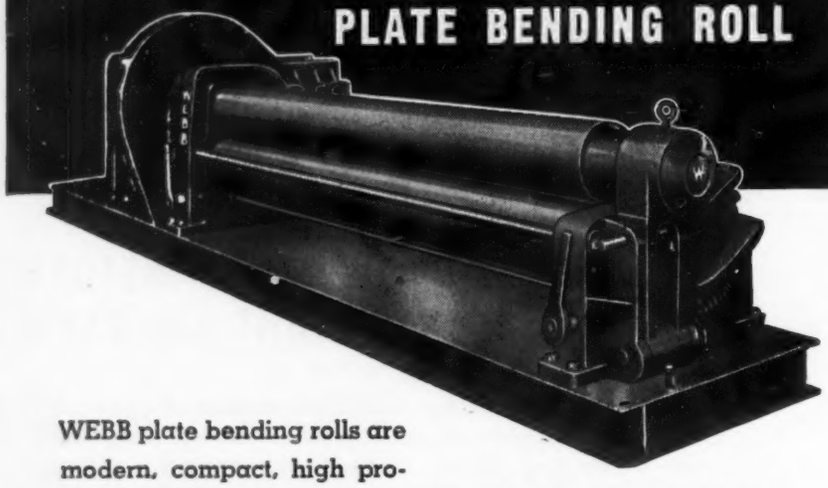

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**Chicago** — Demand for pig iron holds at top level, with supply inadequate to meet melting requirements of foundries. With government subsidies on pig iron for the housing program extended on June 30, there is much less speculation as to what may happen pricewise. Some interests believe a price rise in basic will be made, but it is unlikely that it will be made until after it is known what the miners' union expects to do about coal mining after July 1 when the current contract will have expired. Because coal supplies are abnormally low, any mine stoppage lasting more than a week or ten days would result in banking of many blast furnaces. Department of Public Works, Chicago, will take bids July 3 on 200 tons of off-grade pig iron, this being needed as temporary ballast in connection with bridge construction.

**Buffalo** — Tighter tendencies appeared in the pig iron market last week of capacity slipped to 81½ per cent of capacity. Republic Steel Corp. shut down one of its three blast furnaces for relining. The furnace was on basic iron, some of which moved into the merchant trade when the mill's requirements were filled. The withdrawal of this furnace left the area with three idle stacks.

While sellers of merchant foundry iron confirm a slight easement in the pressure for deliveries, they do not appear concerned and report no trouble in moving the entire current output.

**Cincinnati**—Foundries here were uneasy last week, because of the coal mine situation, over supplies of pig iron. Shipments so far this year have been on virtually unchanged allotments and, even without furnace interruptions, the outlook for greater tonnages soon were none too bright. By-product coke ovens tried to stock coal against the miners' acts, thereby adding to costs which are the basis for talk that eventually higher coke prices may be sought. Some of the coal was obtained in the open market.

**Birmingham** — Pressure for delivery of pig iron is maintained and has even increased in some instances. The days ahead will see this situation intensified as a result of the coal strike which closed practically every coal mine in the state on June 24. Tougher sledding in an already tough pig iron situation is in immediate prospect.

**St. Louis**—Pig iron continues in extremely tight supply. Koppers United is at a 1000-ton production rate following a two-month shutdown of 500 tons capacity for repairs. Few consumers were able to obtain iron from outside sources during the period, consequently the backlogged demand is heavy. Increased worker efficiency has improved output to some extent. Hedging against a possible coal strike, Koppers here has added a few days to its fuel stockpile, with the result iron production will not be affected for at least a month.

## Reinforcing Bars. . .

**Reinforcing Bar Prices, Page 114**

**Chicago** — New inquiry for reinforcing steel involving over 100 tons has become almost nonexistent in this area; likewise, placings are at low level There is, however, a good volume of small jobs, each requiring a few tons, and this is the type of work which suppliers find they can work into their schedules best, considering the shortage of steel.

**Seattle** — Demand for both reinforcing and merchant bars continues strong but the ratio of reinforcing is increasing with public works and industrial construction at high levels. Bulk of new business is in small tonnages, aggregating a large volume. Mills are operating at capacity and are unable to accept all offers, preference being given to regular customers and emergency public works. Some steel for foreign delivery is being rolled by local mills.

## Metallurgical Coke . . .

**Metallurgical Coke Prices, Page 116**

**Cleveland** — Foundry coke production by the area's leading independent interest will not be affected immediately by the coal miners' walkout, coking coal stocks being estimated at 3-4 weeks. A prolonged cessation of mining, however, would quickly cause foundries, already hard-pressed for coke, to curtail production. Aside from the problems arising from the miners' actions, sustained high rate of foundry operation continues to tax the capacity of the coke ovens and only slight relief from pressing demands will accure from vacation shutdowns by melters. A major steel producer here who needs coke badly is stymied on plans to build additional coke ovens by extended delivery date on much of the construction material.

Delivered price for foundry coke is unchanged at $15.90, this city.

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## Scrap. . .

Scrap Prices, Page 120

**Chicago** — Price of open-hearth scrap has advanced $2.50 a ton as result of price pressure and none too plentiful supply. Buying is limited but mills are paying $34, delivered, for material of factory origin and $1 less for dealer scrap, continuing to observe the differential established in the preceding week. Current price is only $2 below the postwar high of $36 quoted last March. Bulk of activity is among brokers and dealers in filling old orders at lower prices. Various railroad items are at levels well above customary differentials. Threat of coal mining tieup appears to have little effect in stimulating mills to buy as an offset to possible reduction of blast furnace production.

**Cleveland** — Scrap market remained firm to strong here last week, the price range on heavy melting steel narrowing to $33.50 to $34. Local buyers were meeting outside competition for material in an effort to keep available supplies in this district. Foundries were particularly active in the market since any reduction in pig iron supplies which may result from the walk-out of miners will require them to increase the proportion of scrap in their melts. The future trend in scrap prices is uncertain, depending on the duration of the curtailment in mining and its ultimate effect on open-hearth operations. Railroad scrap prices have advanced to $45 for angles, splice bars, and 3-foot and shorter rails; $44 for railroad specialties; $42 for uncut tires.

**Boston** — In the advance of open-hearth scrap, the temporary differential on No. 1 busheling has disappeared and that grade is generally moving at heavy melting steel prices. After crossing $30, shipping point, prices leveled off at $31, although uncertainty marks the trend. Buying of cast grades continues slack.

**Philadelphia** — Scrap prices here are tending to level off. No. 1 heavy melting and No. 1 busheling are unchanged at $36.50-$37, delivered, although No. 2 heavy melting and Nos. 1 and 2 bundles have been advanced to this range. Machine turnings are higher at $28-$28.50; mixed borings and turnings, $26-$26.50; and short shovel turnings, $28-$28.50. Bar crops and plate and punchings and plate scrap are down to $38-$39, delivered, while cut structurals are higher at $37.50-$38, and chemical borings at $32-$33. All cast grades are unchanged.

Possibility, if not probability, steel production will be curtailed because of labor trouble in the soft coal mines has caused scrap consumers to move cautiously, especially at present high price levels. Some leading trade interests now believe the peak has been reached for the time being and there will probably be a dip before still higher levels are reached, if at all.

Cast scrap is adversely affected by the Washington announcement that pig iron allotments for housing will be continued over the remainder of the year. This means some large consumers, particularly pipe foundries, will receive more iron than otherwise and will therefore be less dependent upon scrap. On the other hand, the market on one or two leading cast grades has been stead-

ied by purchases by an interest who ordinarily relies largely on pig iron.

**Pittsburgh**—With the leading consumer still holding up shipments on old $30 orders and very little buying reported by other mills here, iron and steel scrap prices are largely nominal. However, a sale of open-hearth scrap at $35 was reported last week, up $2.50 a ton. On basis of this sale, the price level for local open-hearth scrap items appears to be at least $35. Some brokers contend they would not be able to cover a $35 order in today's market. It is also pointed out that remote scrap could not be delivered here for less than $37.

Due to very limited scrap buying on part of mills here, considerable local tonnage is said to be moving into surrounding districts, while sharp price upturn in other areas has encouraged many sources to hold out for substantially higher prices.

Cast iron scrap continues scarce and prices are relatively strong. Prices for turnings advanced $2 per ton last week, with machine shop now quoted within range of $29.50 to $30; short shoveling, $31.50 to $32.

Mill inventories of scrap are considered in fair shape. Scrap shipped direct from customers' plants continues to represent over 50 per cent of purchased scrap requirements, and constitutes an important stabilizing factor on prices. Anticipated curtailment of coke production next week will result in a much heavier drain on mills' scrap inventories because of increased cold-metal charge. However, this situation will be offset in part by probable reduction in steel production schedules.

**New York** — Buying by local scrap brokers has eased up considerably over the past week. Apparently they had been reasonably successful in covering on their old contracts. Fresh consumer demand, while active, is still on the conservative side.

Except for chemical borings, which have been advanced about a dollar, the market is unchanged, with No. 1 and No. 2 heavy melting steel, No. 1 bushheling and No. 1 and No. 2 bundles all holding at $32, fob shipping point; and No. 1 cupola cast, charging box cast and heavy breakable cast holding at $41.50 to $42.

**Buffalo** — With dealers discussing the possibility of sharply higher prices, steelmaking grades of scrap advanced $2 a ton here last week with No. 2 material and bundles quoted at $33 to $34 a ton. Some dealers were holding back supplies hoping for still higher prices. On the other hand, the midweek walkout of the miners made consumers cautious. If a coal strike forces a shutdown of steel mills, consumers expressed the opinion that scrap prices would decline.

However, numerous bolstering developments were reported. The Lackawanna Railroad peddled 37 obsolete locomotives, totally unprocessed, for better than $30 a ton. Purchases were reported also of No. 2 material in the area east of Rochester on a basis equal to $35 a ton after freight charges were added. A New England shipment also was reported which involved a total cost of $38 a ton. Some special No. 1 heavy melting offerings brought $37 a ton. Outside buying interest is noted at above the old $31-32 range, but dealers have shown a preference to do business with local sources. Dealers report plenty of bidding, but tonnage has been restricted on new sales.

**Cincinnati**—Buying of iron and steel scrap is more active than in recent weeks, and at higher prices. All grades followed heavy melting steel in a $1 advance. Undoubtedly, some melters are inspired toward larger inventories by desire to fortify against a stoppage in coal shipments. Moreover, market interests hold fast to a contention that scrap tonnage is persistently short of the extraordinary demands.

**Birmingham** — Scrap movement was somewhat improved this week. Brokers say increased prices on heavy melting last week, plus a few days cessation of inclement weather to allow preparation of a greater tonnage, are mainly responsible. The market was described as steady here last week.

**St. Louis**—Scrap prices have risen briskly in this district in response to the recent jump in the East. Locally, it is attributed to a continued moderate decline in shipments, and buying by numerous small melters who fear to stay out of the market longer. There is also some hedging against greater pig iron scarcities that a coal strike might bring. Mill and foundry reserves, however, generally remain above 45 days. The rising prices have trimmed shipments noticeably, a trend probably due to continue until prices stabilize or ease. Some dealers regard this as only a temporary price rally. Many June orders on which delivery was not made have been

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extended through July. Buying is cautious. Price increase is expected to improve shipments somewhat the next two weeks.

**Seattle** — Improved deliveries for steel scrap were reported by mills in this area last week. Ship breaking plants are producing increased tonnages and normal sources are shipping larger tonnages. The outlook for the balance of the year is fair.

## Warehouse. . .

Warehouse Prices, Page 117

**Cleveland** — Cutting extras, revised last week by most warehouses for bars and bar shapes and strip, were increased last week on structurals, the cost of cutting now ranging from 10 cents to 90 cents, against a range of 7 cents to about 45 cents previously. Pricing methods on cutting extras for bars have been changed, establishing a higher charge for the first cut and a different charge for subsequent cuts; previously a uniform price per cut had been charged. The number of orders requiring cutting varies with types of customers served but generally something less than 50 per cent of customers will be affected by the new extras, the majority ordering stock lengths.

**Pittsburgh** — Warehouse steel customers in recent weeks have been more hard pressed than usual in obtaining adequate steel tonnage to maintain production schedules due to local AFL-Teamsters strike. Considerable tonnage is shipped via rail in "trap" cars, which makes possible shipment of a variety of steel products, with exception of cold-finished, to more than one destination. However, those companies not on railroad sidings have had to curtail production schedules. Distributors' stocks have recorded little improvement in recent weeks despite disruption of shipments to local consumers. Considerable tonnage in excess of previously established quotas is being shipped via rail to customers at remote points, but their receipts will be correspondingly temporarily reduced when local truck strike is terminated. Some distributors are hopeful that the mills will have bulk of substantial carryover tonnage cleared up by end of third quarter.

**Philadelphia** — Last minute postponement of an advance in lcl freight rates on iron and steel products, scheduled originally for June 20, has delayed for several months the necessity for jobbers revising their prices on this score. However, increases in cutting rates by jobbers, as announced recently in certain districts to compensate for higher labor costs, has spread to other districts. Distributors here have increased cutting rates from an average of around 35 cents per piece to around 50 cents.

**Boston** — Demand for steel from warehouses is lower, but is in excess of supply in flat-rolled products, plates, structurals, steel pipe, and wire products. Supply of alloy and stainless products, and cold-finished bars is ample to meet demand. In the critical items, distributors look for no improvement in mill supply in the third quarter.

**Chicago**—Warehouses had been prepared to announce slightly higher prices last week to take into account the 25 per cent increase in less-than-carload freight as of June 20, but this action was withheld when imposition of the higher freight was suspended. Somewhat higher extras are now in effect on cutting of bars and similar revisions for cutting structurals are in prospect. Increased labor costs are assigned as the reason. Demand for steel holds steady and on most products except for alloys is in excess of stocks. Receipts from mills in virtually all products is substantial but inadequate.

**Cincinnati**—Sales volume of warehouses was well sustained during June, with the total keyed to supplies of scarce items. Improvement in mill shipments of angles and small bars developed recently. Receipts of sheets, plates and structurals are far below demand.

**Seattle** — There is no change in the warehouse market. Jobbers report a steady demand for all items. Sheets, nails and reinforcing bars are still extremely tight. No relief in the sheet supply situation is expected until late in the year. Stocks are badly broken and low as most shipments are forwarded directly to the job.

## Rails, Cars . . .

Track Material Prices, Page 115

**New York** — While the Wheeling & Lake Erie has entered the market for 1000 seventy-ton hopper cars recently, freight car inquiry in general has declined. However, several fair sized lists are pending throughout the country. Leading awards involve 400 forty-ton refrigerator cars for the Western Fruit Express Co., to be built in the Chicago shops of the American Car & Foundry Co., this city.

**Cleveland** — Proceeds from a proposed issue of $1,350,000 of serial equipment trust certificates would be applied by the Nickel Plate toward purchase of 19 type 4-0-4, 1000 horsepower diesel-electric standard switching locomotives, costing an estimated $1,700,898.

## Tungsten Ore. . .

**New York** — Tungsten ore has again advanced, now holding at $32 to $34 per short ton unit, duty paid. As a result of this continued increase, it now appears practically assured that tool steel sellers generally will advance their prices on the tungsten steels in the near future. Certain sellers indicate that there may be advances by July 1.

## Steel Supplies Somewhat Freer On West Coast

**San Francisco** — Supplies of some steel products are increasing in this area.

Bars, bar shapes and plates are more readily available now than in recent months, and the supply of structural shapes is plentiful. However, there are no surpluses of any items as yet.

On the other hand, the shortage of sheets and strip is more acute than ever, and it is likely that scarcity of those items

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will get worse before the end of the year.

Steel users do not foresee any increases in sheet and strip supplies until some time next year when Columbia Steel Co.'s new continuous rolling mill is in operation, or until Bethlehem's Sparrows Point, Md., mill resumes shipments. Only a trickle of sheets and strip is coming from eastern mills at present.

## Bureau of Mines Reports on Tin Deposits in N. Mex.

Only small percentages of metal could be produced from low-grade tin deposits in the Taylor Creek mining district in Catron and Sierra counties, N. Mex., the U. S. Bureau of Mines has determined through a thorough investigation. Results of the study are set forth in Report of Investigations 4068, free copies of which may be obtained from the bureau, Washington 25, D. C.

## Steel Containers Eliminated From WAA Scrap List

Regulation No. 9 of the War Assets Administration has been revised to eliminate steel containers from the surplus property that may be sold by WAA representatives for its scrap value. This is because of the scarcity of steel containers, which permits them to be sold for further use as containers. Only damaged containers now are sold as scrap.

## Large Foreign Demand Seen For Diesel-Electric Engines

Large-scale export of diesel-electric locomotives to foreign railroads within the next two years was predicted recently by Robert B. McColl, president, American Locomotive Co., New York, as he announced receipt of an order for twelve 1500-hp diesel-electric freight locomotives from the Central Railroad of Brazil. Delivery of the engines is to be made in May, 1948.

## STRUCTURAL SHAPES . . .

### STRUCTURAL STEEL PLACED

1160 tons, plant extension, Carbon & Carbide Chemical Co., Texas City, Tex., to Bethlehem Steel Co., Bethlehem, Pa.

1100 tons, Northport bridge, Washington state highway department, to Midland Structural Steel Co., Chicago, low $518,500.

1000 tons, plant expansion, Hoffman-La Roche Co., Nutley, N. J., through J. W. Ryan to Bethlehem Steel Co., Bethlehem, Pa.

800 tons, theater, Hempstead, Long Island, to Harris Structural Steel Co., New York.

800 tons, power plant extension, Central Illinois Electric & Gas Co., Rockford, Ill., to A. C. Woods & Co., Rockford, Ill.; Stone & Webster Engineering Corp., Boston, engineers.

650 tons, Catholic high school, White Plains,


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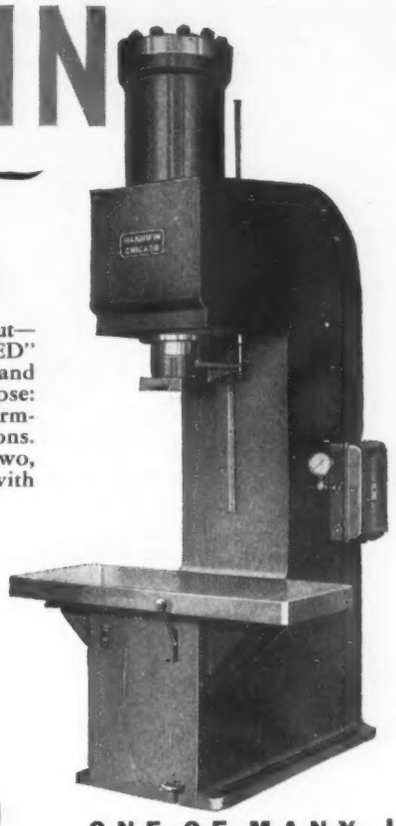

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N. Y., through George A. Fuller & Co., New York, to Ingalls Iron Works Co., Birmingham, Ala.

500 tons, Corson's Inlet, N. J., bridge for Cape May County Bridge Commission, to Bethlehem Steel Co., Bethlehem, Pa.

215 tons, sand storage building and tower, International Harvester Co., Milwaukee, to Gage Structural Steel Co., Chicago; Permanent Construction Co., Milwaukee, contractor.

200 tons, mill building, Camp Upton, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

190 tons, sheet piling, dock, Wisconsin Steel Division, International Harvester Co., South Chicago, Ill., to Carnegie-Illinois Steel Corp., Chicago.

150 tons, plant addition, American Cyanamid Co., Pearl River, N. Y., to American Bridge Co., Pittsburgh.

### STRUCTURAL STEEL PENDING

5000 tons, lock 27, Mississippi Chain of Locks, Madison County, Ill., to Madison Construction Co., comprising several contractors, including Raymond Concrete Pile Co., Turner Construction Co., Spencer, White & Prentis Inc., Morris & Knudsen, L. Johnson and Winston Bros.; 6000 tons of piling for this project is reported to have recently been placed with Carnegie-Illinois Steel Corp., Pittsburgh.

2900 tons, section of municipal elevated highway, downtown, Manhattan, New York city, Lynn Construction Co., that city, low on general contract.

1650 tons, sheet piling, power house, Sault Ste. Marie, Mich., for government; United Construction Co., Winona, Minn., low on general contract; bids June 18.

275 tons, addition, Bell Telephone Exchange, Trenton, N. J., bids asked.

260 tons, bridge repairs, Illinois and New Mexico, for Atchison, Topeka & Santa Fe railroad; American Bridge Co., Pittsburgh, low; bids June 17.

260 tons, warehouse, General Motors Corp., Philadelphia; plans revised.

250 tons, press floor framing, *Philadelphia Inquirer*, Philadelphia.

100 tons, public school, Brandywine-Hundred, Del.

100 tons, school, Newark, Del.

Unstated, repairs, bridge between New Hope, Pa., and Lambertville, N. J.; Delaware River Toll Bridge Commission, Trenton, N. J., taking bids.

## REINFORCING BARS . . .

### REINFORCING BARS PLACED

530 tons, highway construction, Butler and Marshall counties, Iowa, for state, to Des Moines Steel Co., Des Moines, Iowa; Booth & Olson Inc., Sioux City, Iowa, contractor.

475 tons, flood control at Tacoma, refrigerator plant at Toppenish, Pasco filtration plant, and Sick's brewery, Seattle, to Bethlehem Pacific Coast Steel Co., Seattle.

252 tons, Tri-State parkway, Sec. 193-2525.1, for Cook county, Ill., to Joseph T. Ryerson & Son Inc., Chicago; Thomas McQueen Co., Forest Park, Ill., contractor.

115 tons, auditorium, Minneapolis, to Bethlehem Steel Co., Bethlehem, Pa.; H. N. Leighton Co., Minneapolis, contractor.

### REINFORCING BARS PENDING

2000 tons, Kostner Ave. auxiliary outlet sewers, Department of Public Works, Chicago; bids June 30.

1000 tons, power house, Bellevue, Nebr., Bates & Rogers Construction Corp., Chicago, contractor.

925 tons, sewer, South Omaha, Nebr., bids June 5.

375 tons, E. 83rd St. subway substructure and superstructure, Department of Public Works, Chicago; Ready Coal & Construction Co., Chicago, low on general contract; bids June 17.

300 tons, Xavier hospital, Dubuque, Iowa; Tunicliff Construction Co., Davenport, Iowa, contractor.

175 tons, bridge, Umpqua forest, Oregon; bids to Bureau of Roads, Portland, Oreg., July 10.

146 tons, Healthwin hospital addition, St. Joseph, Mich.; bids June 22 over estimate and rejected; new bids soon.

140 tons, two units Deschutes project, Oregon; bids to Bureau of Reclamation, Denver, July 10 and 15, respectively.

117 tons, bridge over Little Calumet river, for Cook county, Ill.; Arcole Midwest Corp. low on general contract; bids June 24.

Unstated, north approach to bridge over south branch of Chicago river, Department of Public Works, Chicago; bids July 11.

Unstated, five story, $1 million administration building, University of Washington, Seattle; bids early July.

Unstated, warehouse for Associated Grocers Co-op, Seattle; Aurora Construction Co., Seattle, low $265,900.

Unstated, 3880-foot concrete wall, Oregon state penitentiary, Salem, estimated $177,000; project approved; bids soon.

Unstated, $575,000 dormitory and laundry, Fairview home, Salem, Oreg., and Eastern Oregon hospital, Pendleton, $700,000 project; both approved and bids to State Board of Control, Salem, July 11.

## PLATES . . .

### PLATES PLACED

225 tons, million-barrel oil tank, Public Service Electric & Gas Co., Green Sand, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, tanks for Seattle plant, Monsanto Chemical Co., to Hydraulic Supply Co., Seattle; additional contracts to unstated interests.

### PLATES PENDING

3650 tons, web and standard tie sectional steel sheet piling, for McNary dam, Oregon; bids in to U. S. engineer, Portland.

Unstated, 100,000 gallon steel water dam, for McNary dam, Oregon; bids in to U. S. engineer, Portland.

Unstated, 120,000 gallon water tank for Warden, Wash., alternate wood; Dodson & Eason, Ephrata, Wash., engineers.

## PIPE . . .

### CAST IRON PIPE PLACED

550 tons, 6 to 12-inch cast iron pipe, for Bellingham, Wash., to H. G. Purcell, Seattle, for U. S. Pipe & Foundry Co., Burlington, N. J.

### CAST IRON PIPE PENDING

1300 tons, 4 to 12-inch cast iron pipe, for Tacoma, Wash.; sole bidder H. G. Purcell, Seattle, for U. S. Pipe & Foundry Co., Burlington, N. J.

Unstated, 20,000 feet, 4 to 8 inch cast iron pipe, Alderwood Manor, Wash.; bids June 30 to H. O. Hutt, secretary.

### STEEL PIPE PENDING

Unstated, 6000 feet, 4 to 10-inch steel pipe for Warden, Wash., or alternate; bids July 10; Dodson & Eason, Ephrate, Wash., engineers.

## RAILS, CARS . . .

### RAILROAD CARS PENDING

Wheeling & Lake Erie, 1000 seventy-ton hoppers, bids asked.

### RAILROAD CARS PLACED

Western Fruit Express Co., 400 forty-ton refrigerator cars, to the Chicago, Ill., plant of the American Car & Foundry Co., New York.

### RAILS PLACED

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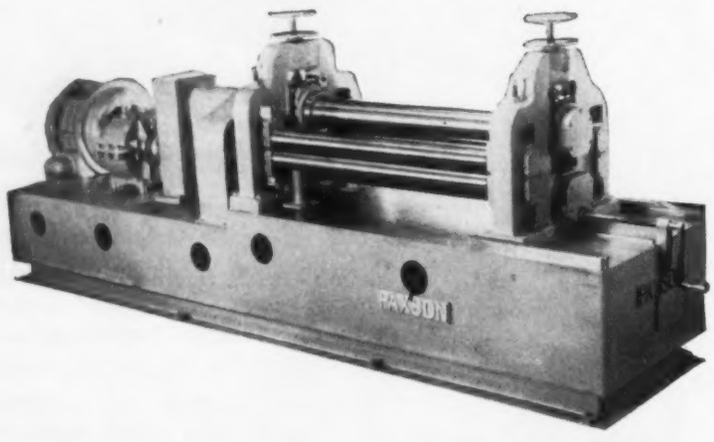


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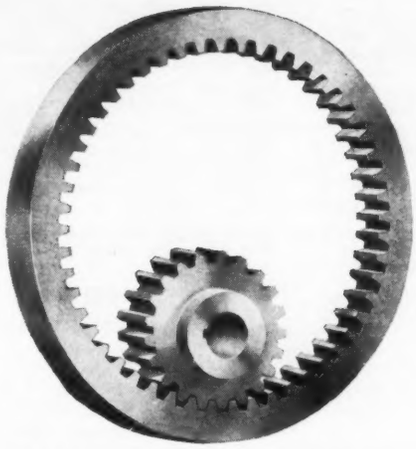

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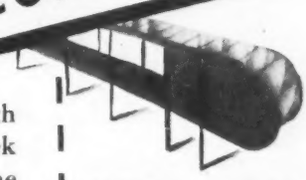

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# CONSTRUCTION AND ENTERPRISE

## ALABAMA

ALABAMA CITY, ALA.—Dwight Mfg. Co. plans construction of an industrial type heating system in its present plant. Estimated cost is $125,000.

GADSDEN, ALA.—Alabama Power Co. has started work on its new $12 million steam generating plant. Thomas W. Martin, president, said the plant will be in production in early 1949.

## ARKANSAS

FT. SMITH, ARK.—Progress Cutlery Co. has filed articles of incorporation for the manufacture of steel cutlery and metal specialties. L. C. and M. L. Bogner are principals.

## CALIFORNIA

BURBANK, CALIF.—Valley Steel Building Co., 611 S. Glendale Blvd., has been formed by Paul A. Barnett.

INGLEWOOD, CALIF.—Leserer Iron Works has been formed by Chris Leserer, Prairie Ave.

LOS ANGELES—Schrillo Aero Tool Engineering Co., 8715 Melrose Ave., has been formed by Anthony T. Schrillo and associates.

LOS ANGELES—Industrial Steel Corp. of California has been formed by A. R. de Santos and associates with 50,000 shares of no par value capital stock. Firm is represented by Charles D. Munro, 322 Hellman Bldg.

SAN FRANCISCO—Pelton Water Wheel Co. has received a $500,000 contract for a hydraulic turbine for a bridge project of British Columbia Electric Railway Co.

SANTA ANA, CALIF. — Richards Machine Works has been incorporated by James F. B. Richards with a capital of $500,000. Firm is represented by Forgy, Reinhause and Forgy, First National Bank Bldg.

## CONNECTICUT

BRISTOL, CONN.—Wallace Barnes Co., 30 Main St., plans to build a 1-story factory on Broad St., costing $1,300,000. Plans are by Giffels & Vallet Inc., 1000 Marquette Bldg., Detroit.

## FLORIDA

MIAMI, FLA.—J. E. Salinger, 228 N. W. 34th St., will build a $65,000 factory addition. Architect is E. A. Ehmann, 206 N. E. 56th St.

## GEORGIA

AMERICUS, GA.—Sheffield Co. has abandoned its $163,000 project for a warehouse here.

ATLANTA—Alston-Lucas Paint Co. plans to build a $100,000 paint plant here.

ATLANTA—Besser Mfg. Co., Candler Bldg., plans to build a $100,000 manufacturing building.

HARPEVILLE, GA.—Southeastern Mfg. Co., P. E. Furlow, president, has awarded a $60,000 contract to Johnson & Johnson Construction Co., Rome, Ga., for construction of an automotive parts plant. New equipment will cost $50,000.

MACON, GA.—Bibb Mfg. Co. has awarded a $55,000 contract for a mill addition to Williams Construction Co., Columbus, Ga.

MACON, GA.—General Chemical Co., New York, will construct a plant on a 22-acre site acquired on Gantt City Rd. Initial investment will be $200,000 in plant to manufacture aluminum sulfate.

## ILLINOIS

CHICAGO—Great Lakes Spring Corp., 7035 W. 65th St., suffered damages from fire estimated at $100,000.

CICERO, ILL.—Motive Equipment Manufacturers Inc., 4600 W. Harrison St., plans to build a $275,000 factory. Engineers are A. Epstein & Sons, 2011 W. Pershing Rd., Chicago.

DECATUR, ILL.—A. E. Staley Mfg. Co. has approved a $10,835,000 modernization program.

ROCKFORD, ILL.—Woodward Governor Co. has been awarded a contract, amounting to $236,114, from the Bureau of Reclamation for nine governors regulating the speed of turbines at the Davis Dam power plant on the Colorado river in Arizona and Nevada and the Estes and Marys Lake power plant in Colorado.

## IOWA

DES MOINES, IOWA—Armstrong Furnace Co., Columbus, O., will build a $600,000 factory here.

## KENTUCKY

PADUCAH, KY.—Magnavox Co. has let a contract to George W. Katterjohn & Son at $207,749 for construction of plant on N. 8th St. for manufacture of radio equipment. Total cost of plant, including equipment, will be about $1 million.

## LOUISIANA

BATON ROUGE, LA. — Permanente Metals Corp, John M. Garoutte, project manager, has let a contract to W. Horace Williams Co., Southern Bldg., New Orleans, for construction of a dock on the Mississippi to accommodate ocean-going bauxite freighters.

MONROE, LA.—Selig Mfg. Co. will install machinery to the extent of $175,000 in a proposed plant for the manufacture of furniture.

## MARYLAND

MUIRKIRK, MD.—Mineral Pigments Corp., N. D. Scowe, president, has started work on an addition to its plant in which $350,000 ultimately will be invested in a new method of producing directly from scrap iron, synthetic yellow, red, brown and black iron oxides. Initial production will be about 50,000 lbs monthly.

## MICHIGAN

DETROIT—Active Tool & Mfg. Co. has completed plans for construction of a $50,000 plant addition.

DETROIT—Steel Plate & Shape Corp., 15050 Woodward Ave., plans to build a $762,000 factory and office.

MANISTEE, MICH.—Manistee Iron Works Co. suffered $150,000 damages from fire recently.

MUSKEGON, MICH.—Fisher Steel & Supply Co. is planning construction of a $200,000 warehouse expansion project.

SAGINAW, MICH.—Saginaw Malleable Iron Division of General Motors Corp. plans to build a $335,000 foundry addition. Plans are by Austin Co., 227 Curtis Bldg., Detroit.

SAGINAW, MICH.—Central Pattern & Machine Co., 220 Court St., has been formed by Wade Coffman with a capital of $100,000 as a foundry and machine shop business.

## NEW YORK

BINGHAMTON, N. Y.—G. H. W. Machine Co. Inc. has been incorporated by Glenn H. Weldy and associates with a capital of $100,000 as a general machine shop business.

ELMHURST, N. Y.—Glidden Co. Inc., 52 Vanderbilt Ave., New York, proposes to alter its 4-story factory on 94th St. at a cost of $300,000. Plans are by H. Austin, c/o owner.

## NORTH CAROLINA

CHARLOTTE, N. C.—Carolina Concrete Pipe Co. Inc. has OHE approval for a building to cost $53,000.

CHARLOTTE, N. C.—Edgcomb Steel Co., Erie Ave., Philadelphia, will build a $500,000 warehouse here.

GULF, N. C.—North Carolina Coal Corp. has been incorporated by Richard M. Moore and associates with capital of $700,000 as a mining and smelting business.

KINSTON, N. C.—Eastern Carolina Engineering Co. has been incorporated by Vance P. Perry and associates with a capital of $100,000 as a general engineering business.

SMITHFIELD, N. C.—Talton Inc. has been incorporated by Hugh Talton and associates with a capital of $50,000 to deal in electrical machinery and appliances.

SPRUCE PINE, N. C.—Feldspar Milling Co., C. P. Rogers, president, will build a $250,000 processing plant.

## OHIO

CLEVELAND—Owen Bucket Co. will build a $102,000 1-story addition to its plant at 6001 Breakwater Ave.

MANSFIELD, O.—Empire Steel Corp., has nearly completed a $250,000 boiler plant and will spend an additional $60,000 for burner and oil storage tank facilities as stand-by equipment.

SALEM, O.—Mullins Mfg. Co. plans to spend $50,000 on alterations to its plant #1 on S. Ellsworth Ave.

SOUTH EUCLID, O.—Pesco Products Co., 11610 Euclid Ave., Cleveland, plans to build a $3 million project here to include laboratories, offices and factory buildings.

YOUNGSTOWN—McKay Machine Co., W. Rayen Ave., plans to build a $104,000 plant addition on W. Federal St.

## TENNESSEE

NASHVILLE, TENN.—Metal Products Co. has been incorporated by Wesley H. Dyer and associates to manufacture and fabricate ferrous and nonferrous products.

## TEXAS

CORPUS CHRISTI, TEX.—Pontiac Refining Corp., 3400 Lawrence St., will build a $1 million plant on a 30-acre site.

HOUSTON, TEX.—American Iron & Machine Works Co., 1801 Semmes St., plans a $750,000 plant expansion.

## WEST VIRGINIA

GLENVALE, W. VA.—Louis Marx & Co. has OHE approval for an addition to a toy factory costing $365,000.

## CANADA

TORONTO, ONT.—P. K. Mallory & Co. Inc., 3029 E. Washington St., Indianapolis, will build a $600,000, 1-story plant here.

TORONTO, ONT.—Gross Mfg. & Supply Co., 108 Front St. E., plans to build a $95,000, 80 x 154 ft office and factory. Architects are Kaplan & Sprachman, 305 Dundas St.

TORONTO, ONT.—Stauntan's Ltd., 939 Eglinton Ave. E, plans to build a $300,000 plant and office and boiler room. Architects are Mather & Haldenby, 15 St. Marys St.

TORONTO, ONT.—Campbell Mfg. Co. Ltd., 9 Commercial St., has awarded a $200,000 contract to Finley W. McLachian Ltd., 195 Fairbank Ave., for a factory and office near Sheppard Ave. and Yonge St.

TORONTO, ONT—Canadian Fairbanks-Morse Co. Ltd., 26 Front St. W., has awarded a $300,000 contract to Milne & Nicholls Ltd., 57 Bloor St. W., for a 2-story plant and office building.

WELLAND, ONT.—J. Stokes Rubber Co. Ltd., plans to build a $350,000 plant addition.

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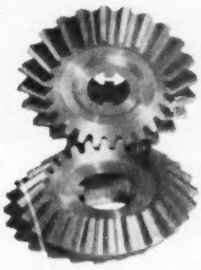

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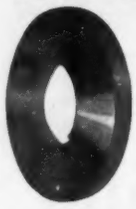

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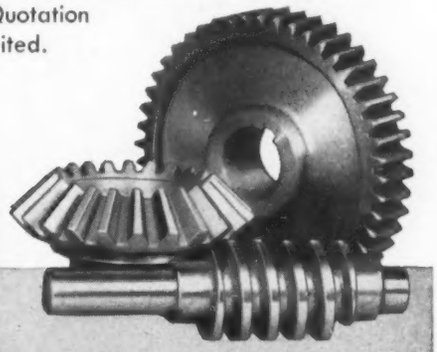

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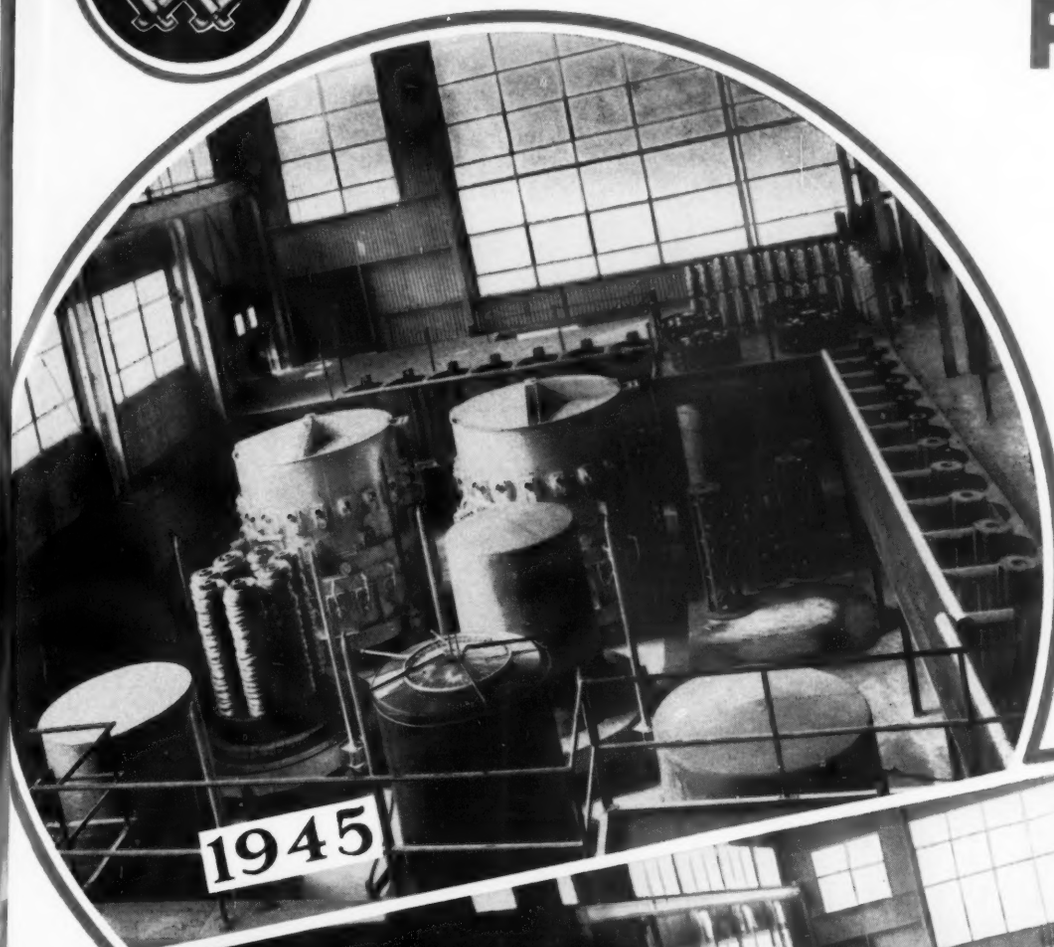
# he WILSON WIRE ANNEALING FURNACE

## installation *at*

the Palmer, Massachusetts Plant of the Wickwire Spencer Steel Division of The Colorado Fuel and Iron Corp. **Now** comprises 4 74"x84" Furnaces and 14 Bases.



e Wilson Annealing
nit is covered by
atents Nos. 1,952,402,
,068,477, 2,078,356,
,081,612, 2,089,843 and
other patents pending.

Over 100 Tons of Low Carbon Wire are annealed each 24 hours in this department!

USTRIAL FURNACES ★

DIANT TUBE HEATING ★

AT TREATING PROCESSES

ENGINEERED AND CONSTRUCTED BY THE

Lee Wilson ENGINEERING CO., Inc.

20005 West Lake Road CLEVELAND, OHIO

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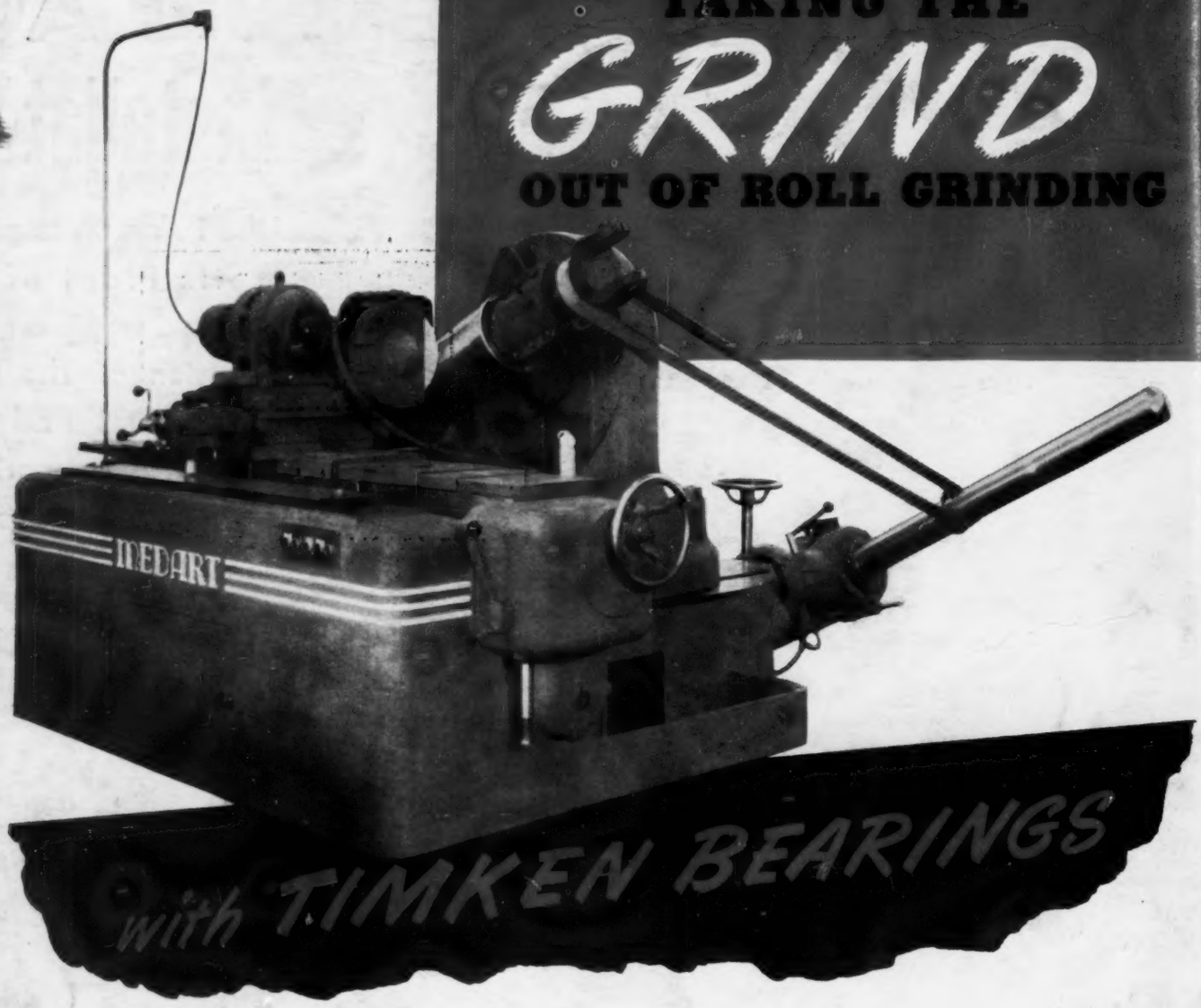
# TAKING THE GRIND OUT OF ROLL GRINDING




The Medart Company, St. Louis, believes in Timken Tapered Roller Bearings, uses a lot of them in the different types of machines it builds and sells. That's one of the reasons why Medart equipment is noted for its accuracy, productivity, economy.

Medart practices what it preaches, too; uses Timken Bearing Equipped machines of its own design and manufacture to perform some of the most important operations in the equipment built for others.

Take the roll grinding machine pictured above for example; it is used primarily to grind the rolls of Medart straightening machines; can grind all other kinds of rolls that can be mounted in their own yokes.

Seven Timken Bearings are used at vital operating points in this machine — including the *grinding wheel shaft,* most important of all. It pays to look for the trade-mark "TIMKEN" on every bearing you use. The Timken Roller Bearing Company, Canton 6, Ohio.

**TIMKEN**
TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ⬯ AND THRUST →⬯← LOADS OR ANY COMBINATION →✳←